



REGULAR CITY COUNCIL MEETING

6:30 PM – COUNCIL CHAMBERS – CITY HALL

MAY 18, 2021

AGENDA

ALL CITIZENS DESIRING TO ADDRESS THE PORT ORANGE CITY COUNCIL DURING CITIZEN PARTICIPATION SHOULD COMPLETE A SPECIAL APPLICATION FORM WHICH IS LOCATED ON THE STANDS OUTSIDE THE COUNCIL CHAMBERS. AFTER COMPLETING THE FORM, PRESENT IT TO THE CITY CLERK.

A. OPENING

1. Invocation by Rev. David Troxler of First Christian Church of Daytona
2. Pledge of Allegiance
3. Roll Call

B. SPECIAL AWARDS, REPORTS, RECOGNITION AND PROCLAMATIONS

4. Get Fit Winner's and Overall Program Statistics
5. Youth Leadership Recognition
6. Recognition of the 50th Anniversary as an ICMA recognized Council-Manager form government
7. Update from YMCA

C. CONSENT AGENDA

8. Public Comments on Consent Agenda Items Only
9. Agenda Approval
10. Approval of Minutes
 - a. May 4, 2021 - Regular City Council Meeting
11. Approval of Task Authorization No 14 - DJ Design, Inc. for Fire Station #74 Ceiling Architectural Design Services
12. Resolution No. 21-21 - Approving a State-Funded Grant Agreement for FPN 439865-3-34-01, for design of the SUNTrail/St Johns River to Sea Loop Trail

13. Resolution No. 21-25 - Interlocal Agreement for Distribution of the Local Option Fuel Tax
14. Approval of Modification for a Time Extension for the Grant Agreement from Florida Division of Emergency Management for the Virginia Avenue and Monroe Street Drainage and Water Quality Project
15. Approval of Agreement with Volusia County Tax Collector for the Utilization of the Uniform Method of Collection of Non-ad Valorem Assessments
16. Approval of Volusia County Justice Assistance Grant (JAG) Agency Funding Allocation

D. CITIZEN PARTICIPATION (Non-Agenda – 20 minutes)

E. COUNCIL COMMENTS

17. Comments/Concerns from Council Members

F. BOARD APPOINTMENTS, INTERVIEWS, REPORTS

18. Citizen Advisory Committee for TPO

G. REGULAR AGENDA

19. First Reading - Ordinance No. 2021-10 - Fire and Rescue Pension Fund Sections 54-77 and 54-104
20. Renovation & Expansion of the REC
 - a. Resolution No. 21-22 - Parks and Recreation - Additional funding for contract for REC renovation and expansion
 - b. Award of ITB #21-13 to Saboungi Construction Corporation for renovation and expansion of the REC

H. ADDITIONAL ITEMS

21. City Attorney
22. City Manager

I. COUNCIL COMMITTEE REPORTS

23. City Council Committee Reports
 - a. ArtHaus
 - b. First Step Shelter
 - c. Port Orange/South Daytona Chamber of Commerce
 - d. Roundtable of Elected Officials

J. ADJOURNMENT

NOTICES — PURSUANT TO SECTION 286.0105 OF THE FLORIDA STATUTES, IF ANY PERSON DECIDES TO APPEAL ANY DECISION MADE BY THE CITY COUNCIL WITH RESPECT TO ANY MATTER CONSIDERED AT THIS PUBLIC MEETING OR HEARING, SUCH PERSON WILL NEED A RECORD OF THE PROCEEDINGS, AND THAT, FOR SUCH PURPOSE, SUCH PERSON MAY NEED TO ENSURE THAT A VERBATIM RECORD OF THE PROCEEDINGS IS MADE, WHICH RECORD INCLUDES THE TESTIMONY AND EVIDENCE UPON WHICH THE APPEAL IS TO BE BASED. THE CITY DOES NOT PREPARE OR PROVIDE SUCH A RECORD.



FOR SPECIAL ACCOMMODATIONS, PLEASE NOTIFY THE CITY CLERK'S OFFICE (PHONE: 386-506-5563) AS FAR IN ADVANCE AS POSSIBLE, BUT PREFERABLY WITHIN 2 WORKING DAYS OF YOUR RECEIPT OF THIS NOTICE OR 5 DAYS PRIOR TO THE MEETING OR HEARING DATE.



HELP FOR THE HEARING IMPAIRED IS AVAILABLE THROUGH THE ASSISTIVE LISTENING SYSTEM RECEIVERS CAN BE OBTAINED FROM THE CITY CLERKS' OFFICE.

IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA), IF YOU ARE A PERSON WITH A DISABILITY WHO NEEDS AN ACCOMMODATION IN ORDER TO PARTICIPATE IN THIS PROCEEDING, YOU ARE ENTITLED, AT NO COST TO YOU, THE PROVISION OF CERTAIN ASSISTANCE. PLEASE CONTACT THE CITY CLERK FOR THE CITY OF PORT ORANGE, 1000 CITY CENTER CIRCLE, PORT ORANGE, FLORIDA 32129, TELEPHONE NUMBER 386-506-5563, CITYCLERK@PORT-ORANGE.ORG, AS FAR IN ADVANCE AS POSSIBLE, BUT PREFERABLY WITHIN 2 WORKING DAYS OF YOUR RECEIPT OF THIS NOTICE OR 5 DAYS PRIOR TO THE MEETING OR HEARING DATE. IF YOU ARE HEARING OR VOICE IMPAIRED, CONTACT THE RELAY OPERATOR AT 7-1-1 or 1-800-955-8771.

UPON REQUEST BY A QUALIFIED INDIVIDUAL WITH A DISABILITY, THIS DOCUMENT WILL BE MADE AVAILABLE IN AN ALTERNATE FORMAT. IF YOU NEED TO REQUEST THIS DOCUMENT IN AN ALTERNATE FORMAT, PLEASE CONTACT THE CITY CLERK WHOSE CONTACT INFORMATION IS PROVIDED ABOVE.

ANY INVOCATION THAT IS OFFERED BEFORE THE OFFICIAL START OF THE CITY COUNCIL MEETING SHALL BE THE VOLUNTARY OFFERING OF A PRIVATE PERSON, TO AND FOR THE BENEFIT OF THE CITY COUNCIL. THE VIEWS OR BELIEFS EXPRESSED BY THE INVOCATION SPEAKER HAVE NOT BEEN PREVIOUSLY REVIEWED OR APPROVED BY THE CITY COUNCIL OR THE CITY STAFF, AND THE CITY IS NOT ALLOWED BY LAW TO ENDORSE THE RELIGIOUS BELIEFS OR VIEWS OF THIS, OR ANY OTHER SPEAKER. PERSONS IN ATTENDANCE AT THE CITY COUNCIL MEETING ARE INVITED TO STAND DURING THE OPENING INVOCATION AND PLEDGE OF ALLEGIANCE. HOWEVER, SUCH INVITATION SHALL NOT BE CONSTRUED AS A DEMAND, ORDER, OR ANY OTHER TYPE OF COMMAND. NO PERSON IN ATTENDANCE AT THE MEETING SHALL BE REQUIRED TO PARTICIPATE IN ANY OPENING INVOCATION THAT IS OFFERED. A PERSON MAY EXIT THE CITY COUNCIL CHAMBERS AND RETURN UPON COMPLETION OF THE OPENING INVOCATION IF A PERSON DOES NOT WISH TO PARTICIPATE IN OR WITNESS THE OPENING INVOCATION.



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 5/18/2021

Consent item: No

SUBJECT: (B5) Youth Leadership Recognition

DEPARTMENT: Parks & Recreation

GOAL:

RECOMMENDED MOTION:

SUMMARY: The 2020-2021 Port Orange Youth Leadership Program is concluding in May. The 3 program participants are High School Juniors and Seniors. They began in August by attending Port Orange University to learn about each Department's role. Beginning in November, the group began meeting monthly to work on their capstone project which was to plan and build a community garden. The group met with local master gardeners and toured other local community gardens. They successfully designed the garden to be built behind the old train depot on Herbert Street. They researched funding and set goals for securing sponsorships and grants. They connected with local community groups to assist with the build day and planned the garden policies and procedures. The foundation of the garden project is now there, and the next group will be tasked with securing funding and implementing the opening plan. Program Participants: Marta Zherukha, Tate Johansson, and Shelby Balmer

Project No.:

Funding Account No.:

Presenter: Peter Ferreira

ATTACHMENTS:

Peter Ferreira
Peter Ferreira
Robin Fenwick

Created/Initiated - 5/3/2021
Approved - 5/5/2021
Final Approval - 5/5/2021

REGULAR CITY COUNCIL MEETING MINUTES
COUNCIL CHAMBERS – CITY HALL
1000 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA
MAY 4, 2021

THE REGULAR CITY COUNCIL MEETING of the City of Port Orange was called to order by Mayor Donald O. Burnette at 6:30 p.m.

Invocation by Pastor Sheila Turner of A Touch of HIS Hem Ministries

Pledge of Allegiance

Roll Call Present: Council Member Jonathan Foley
 Council Member Chase Tramont
 Council Member Scott Stiltner
 Vice Mayor Drew Bastian
 Mayor Donald Burnette

 Also Present: City Manager Wayne Clark
 City Attorney Matthew Jones
 City Clerk Robin Fenwick

CONSENT AGENDA

4. Public Comments on Consent Agenda Items Only

Robert Reinhausen, citizen, spoke regarding his concerns with the wrecker service contract being proposed under Item 7(b).

Chris Holland, Acentria, spoke regarding Item 7(a) and their proposed services provided during the bidding process for RFP #21-04 Broker Services for Employee Insurance.

5. Agenda Approval

There were no changes requested by Council.

Motion to approve the Agenda as presented was made by Vice Mayor Drew Bastian and Seconded by Council Member Chase Tramont. Motion carried unanimously by voice vote.

6. Approval of Minutes

- a. April 20, 2021 - Regular City Council Meeting
- b. April 28, 2021 - City Council Workshop

7. Bid Awards and Contract Items

a. Approval of RFP #21-04 Broker Services for Employee Insurances to Brown & Brown, Inc.

b. Intent to Award RFP #21-02 (Wrecker Service Agreement) to J & A Balboa Enterprises, Inc. DBA Arrow Service & Towing.

c. Intent to Award ITB #21-04 - Athletic Field Pest Control and Fertilization Services to Lake Jem Farms of Tavares

d. Approval of Agreement with Sensus USA, Inc. and Sensus Spectrum LLC (a Subsidiary of Sensus USA) Lease Agreement to upgrade the water meter reading equipment and software

8. Resolution No. 21-24 - Budget and Appropriate increase in Victims of Crime Act (VOCA) Grant

9. Approval of Sabal Creek Traffic Enforcement Agreement

10. Approval of TD Bank as Investment Custodial Bank

11. Approval of an Amendment to the Administrative Code

12. Approval of Historic Tree Removal Request, 207 Brittany Avenue

13. Approval of Historic Tree Removal Request, 59 Golden Gate Circle

Motion to approve the Consent Agenda as presented was made by Vice Mayor Drew Bastian and Seconded by Council Member Scott Stiltner. Motion carried unanimously by roll call vote.

CITIZEN PARTICIPATION (Non-Agenda – 20 minutes)

Mr. Reinhagen spoke regarding the Riverwalk Park workshop and his concerns with the changes in the vision.

COUNCIL COMMENTS

14. Comments/Concerns from Council Members

Council Member Jonathan Foley presented Jamie Miller with a gift from Council for her work as Interim City Manager. Mayor and Council thanked her for stepping up.

Council Member Scott Stiltner spoke regarding the Riverwalk Park workshop and thanked Staff for their work. He asked Police Chief Thomas Grimaldi to discuss the plan for notice along Dunlawton Avenue for the work FEC is doing at the railroad crossing.

Mayor Don Burnette spoke regarding a news story regarding inspections. He apologized and assured the public that the City takes inspection services seriously as they are for the safety of our citizens. Corrective action was taken quickly.

BOARD APPOINTMENTS, INTERVIEWS, REPORTS

15. Environmental Advisory Board Report

Kristine Cunningham, Chair, provided an update to Council from their recent meeting.

They look forward to holding a workshop with Council soon. She asked for citizens to apply for vacant positions.

PUBLIC HEARING

16. Second Reading - Ordinance No. 2021-11 - Amendment to Chapter 26, Article IV, Section 26-71 - Emergencies; garbage, trash, debris, refuse in right-of-way and parkages.

Mayor Don Burnette read Ordinance No. 2021-11.

ORDINANCE NO. 2021-11

AN ORDINANCE OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA, AMENDING THE CODE OF ORDINANCES, CHAPTER 26, ARTICLE IV, SECTION 26-71 PROVIDING FOR GARBAGE, TRASH, REFUSE AND DEBRIS TO BE REMOVED BY A PROPERTY OWNER, TENANT, LESSEE, OR OCCUPANT FROM PARKAGES AND RIGHTS-OF-WAY IN TIMES OF AN EMERGENCY AND ESTABLISHING A SERVICE FEE; PROVIDING FOR REPEAL OF CONFLICTING ORDINANCES; PROVIDING FOR CODIFICATION; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

Motion to approve Ordinance No. 2021-11 was made by Vice Mayor Drew Bastian and Seconded by Council Member Chase Tramont. Motion carried unanimously by roll call vote.

REGULAR AGENDA

17. Update on the Dunlawton Avenue Median Landscape Project

Lynn Stevens, Public Utilities/Works Director, provided the background details of the project and advised Council Public Works staff is now maintaining the medians through a contract with VerdeGo Landscaping Company.

ADDITIONAL ITEMS

18. City Attorney

Matt Jones, City Attorney, spoke regarding the opioid crisis and advised there has been a settlement nationwide. The money the City will receive will be fairly low as it gets split between all counties and cities across the nation. An item will be coming before Council soon. He also reminded Council that his employee evaluation is coming up soon. He will provide sample forms for Council's use if they so choose.

19. City Manager

Wayne Clark, City Manager, provided an update on the Coronavirus Local Fiscal Recovery Fund (CLFRF) as provided for by the American Rescue Plan Act (ARPA). The City expects to receive \$9.2 million dollars but there are no directions on spending it yet. The money will be in two equal installments. Staff is working with the known categories for projects that should work. Staff will bring more information as soon as more is known. A Special Meeting may be needed.

COUNCIL COMMITTEE REPORTS

20. City Council Committee Reports
a. River to Sea TPO

Council Member Scott Stiltner reported on the recent meeting held. Money may become available unexpectedly. He asked Staff to have projects "shovel ready."

ADJOURNMENT - 7:30 p.m.

Attest:

Mayor Donald O. Burnette

Robin Fenwick, MMC
City Clerk



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 5/18/2021

Consent item: Yes

SUBJECT: (C11) Approval of Task Authorization No 14 - DJ Design, Inc. for Fire Station #74 Ceiling Architectural Design Services

DEPARTMENT: Public Works

GOAL: 2 - Infrastructure

RECOMMENDED MOTION: Move to approve Task Authorization No. 14 under the Master Contract for Architectural Services with DJ Design Services, Inc. for Fire Station #74 Ceiling/DAQ Architectural Design Proposal, not to exceed \$30,034.00.

SUMMARY: The Public Works & Utilities Department is requesting City Council to approve of Task Authorization No 14 to the Master Contract for Architectural Services with DJ Design Services, Inc. for Fire Station No 74 Ceiling and Indoor Air Quality Architectural Design Proposal, not to exceed \$30,034.00.

This work is to develop plans, specifications, alternatives, and cost estimates to solve the moisture and indoor air quality issues at Fire Station No 74. DJ Design, Inc. will provide architectural, mechanical and electrical construction drawings.

Task Authorization No 14 will be issued to DJ Design Services, Inc. for the above services for an amount not to exceed \$30,034. On April 6, 2021, Council approved Budget Resolution No 21-15 to provide the necessary funding. The terms are to be 90 days to Substantial Completion and 120 for Final Completion from the issuance of a written Notice to Proceed.

Project Funding Account No.: Fund: 506-Building Maintenance, Cost Center-
No.: none Building Maintenance, Program-N/A, Spend Category-Bld Maintenance &
Repairs

Presenter: Lynn Stevens

ATTACHMENTS:

1.	DJ Design Task Authorization No 14 - Fire Station 74	Task Authorization No 14.pdf
2.	Public Utilities Department - DJ Design Task No 14 Fire Sta 74 Ceiling (1)	Public Utilities Department - DJ Design Task No 14 Fire Sta 74 Ceiling (1).docx

Julia Wiggins	Created/Initiated - 4/23/2021
Julia Wiggins	Approved - 4/23/2021
Kynah Cockcroft	Approved - 4/23/2021
Ronny Buttrum	Approved - 4/23/2021
Lynn Stevens	Approved - 4/30/2021
Lupe Reyna-Coffin	Approved - 5/4/2021
Scott Neils	Approved - 5/4/2021
Matthew Jones	Approved - 5/4/2021
Wayne Clark	Approved - 5/11/2021
Robin Fenwick	Final Approval - 5/11/2021

TASK AUTHORIZATION NO. 14
Master Contract for Architectural Services dated January 24, 2017
Between the City of Port Orange, Florida and DJ Design Services, Inc.

THIS Task Authorization is entered into by and between the **CITY OF PORT ORANGE, FLORIDA**, a chartered municipal corporation with its principal place of business at 1000 City Center Circle, Port Orange, Florida 32129 (the "City") and **DJ DESIGN SERVICES, INC.**, a Florida corporation with its principal place of business at 913 North Nova Road, Holly Hill, Florida 32117 ("Architect"), and hereinafter collectively referred to as the "Parties," and is to that certain Master Contract for Architectural Services dated January 24, 2017, and any amendments thereto, hereinafter collectively referred to as the "Contract." The Parties, in exchange for the mutual covenants contained herein and in the Contract, agree as follows:

1. This Task Authorization expressly modifies the Contract and in the event of a conflict, the terms and conditions of this Task Authorization No. 14 shall prevail.
2. The Public Works & Utilities Director, Lynn Stevens, shall perform contract administration for this **Task Authorization No. 14** and can be reached at (386) 506-5759.
3. In addition to all other terms and conditions contained in the Contract, Architect shall provide architectural services for **Fire Station No 74 Ceiling / DAQ Architectural Design Proposal**, as more particularly described in the Scope of Services attached hereto and incorporated herein as Task Authorization Exhibit "1."
4. Architect shall substantially complete the services to be provided herein within **90 days from the issuance of a written Notice to Proceed, with an additional 30 days for final completion.**
5. In return for the services identified above, the City agrees to compensate Architect at the prices set forth in Exhibit "1" attached hereto and made a part hereof for all purposes, subject to a limit not to exceed **\$30,034.00**. All payments shall be governed by the Local Government Prompt Payment Act as set forth in Sections 218.70 through 218.79, Florida Statutes, as amended.
6. This Task Authorization may be executed in one or more counterparts, each of which shall be deemed to be an original but all of which together shall constitute one and the same instrument. The delivery by facsimile or e-mail of an executed copy of this Task Authorization shall be deemed valid as if an original signature was delivered. No contract shall be formed between the Architect and the City until the City signs this Task Authorization.

IN WITNESS WHEREOF, the Parties have made and executed this Task Authorization for the purposes herein expressed on the dates set forth below.

Witnesses:

DJ DESIGN SERVICES, INC.

Printed Name: _____

By: _____
James M. Wachtel, President
If this Contract is signed by an individual not identified as the President of the corporation in the records of the Florida Department of State, Division of Corporations, please provide written authorization for that individual to enter into contracts on behalf of the corporation.

Printed Name: _____

Date: _____

Witnesses:

CITY OF PORT ORANGE

Printed Name: _____ By: _____
Donald O. Burnette, Mayor

Printed Name: _____ Date: _____

Witnesses: ATTEST:

Printed Name: _____ By: _____
Robin L. Fenwick, MMC, City Clerk

Printed Name: _____ Date: _____

[CA 5524]



913 N. Nova Road
Holly Hill, Florida 32117
(386) 255-6987 (386) 255-6989 FAX
AA26000567

ARCHITECTS • PLANNERS

EXHIBIT "1"

April 6, 2021

Robert Bryant
City of Port Orange
1000 City Center Circle
Port Orange, Florida 32129

VIA E-mail

RE: Fire Station #74 Ceiling/IDAQ Architectural Design Proposal – Port Orange, Project No. 02354.26

Bobby,

Per our March 26th meeting with you, Victor Diaz, Li Li, Abdus Sabur and me we have prepared this fee proposal to help you develop remodeling documents to help solve your moisture and indoor air-quality issues at this firehouse. Using the original 1999 drawings and the remodeled 2013 drawings that you provided, we will provide architectural, mechanical and electrical construction drawings. Our scope of work includes:

- Creating CAD files from existing drawings,
- Preparing demolition drawings,
- Architectural Coordination of areas subject to MPE changes, (e.g. fire walls, ceilings, chases),
- Revised reflected ceiling plans, wall sections and details,
- Specifications on the drawings,
- Statement of Probable Construction Cost
- Pre-permit review and limited construction phase services.

We will analyze the existing HVAC system and the configuration of the existing ductwork to combat the current humidity problems and make recommendations for fixing those problems. That work will be done by **Cape Design Engineering (CDE)** and they have proposed a scope-of-work (SOW) and a fee for same (see attached).

Our proposed fee breakdown will be as follows:

- Architectural/Coordination Services- \$5,000
- Mechanical/Plumbing/Electrical engineering - \$22,584
- Pre-permit Review and Bidding Assistance - \$1,200
- Limited Construction Phase Services - \$1,000
- Reimbursable Costs - \$250

Total Fee **\$30,034**

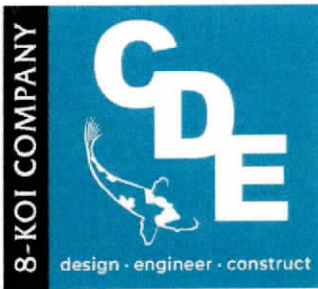
We estimate that our A/E efforts will take approximately 4-6 weeks to produce bid documents and submit for pre-permit review. It is our understanding too, that the project will be "hard-bid" to pre-approved General Contractors. As we've done previously, there is a line-item for pre-permit review with the Building Department, to accelerate final permitting by the selected GC. Including reimbursable costs our projected fee for this work is **\$30,034**.

In the event that the accepted design concept is subsequently modified for reasons beyond our control, the additional services resulting from these modifications shall be cause for additional compensation. Please review this to see if it agrees with *your* understanding of the work efforts needed. If these terms are acceptable, please issue a new Task Assignment and Purchase Order in accordance with our Professional Architectural Services agreement (RFSQ #16-36) and we will begin the design work. As before, thanks as always for considering **DJdesign, Architects and Planners**.

Yours truly,

DJdesign Services Inc.


Dana M. Smith, Architect
Principal



775 E. Merritt Island Cswy.
Suite 230
Merritt Island, FL 32952

P: 321.799.2970
F: 321.799.0375

www.cdeco.com

TO: Dana Smith
DJ Design, Inc.
913 North Nova Road
Holly Hill, FL 32117

CDE: 21-041
March 30, 2021

SUBJECT: Fee Proposal for Port Orange Fire Station #74 – Attic Humidity Problems

Dear Mr. Smith,

Cape Design Engineering Co. (CDE), a wholly owned subsidiary of 8-koi, is pleased to submit this fee proposal for the subject project. The fee covers the following:

Scope of work

This project will analyze the existing HVAC system and configuration of the ductwork on this facility to combat the humidity problem currently existing at the site. CDE will provide recommendations and create construction documents to fix the issue. Additionally some interior light fixtures will be replaced as directed by the City. Our scope of engineering service includes HVAC and Electrical. The existing HVAC system of the facility are split DX units.

Assumptions and Exclusions:

1. All work will be prepared in AutoCAD.
2. Project Specifications will be in book format utilizing MasterSpec.
3. We have assumed (3) design submittals: Report with findings and recommendations, 60% CD and Permit/Bid Set.
4. We have assumed (2) review meetings to be held on site.
5. We have included (1) site visits during construction.
6. We have included (1) final site visit for punch list generation.
7. Construction Support services (submittals, RFIs, etc.) during construction are included in fee.
8. Cost estimates are included.
9. No reproduction is included in this fee. PDF's will be provided at each submittal phase.
10. Preparation of as-built drawings is included.
11. No structural engineering is included in the fee.
12. No sustainable design or LEED/Green Globes submittals are included in this fee.

The total fee for this project is **\$22,584**. This fee is valid for 30 days. CDE will mobilize once a purchase order has been received indicating a notice to proceed and work toward a schedule mutually agreed upon.

We look forward to working with you. If you have any further questions, please feel free to contact us.

Sincerely,



Victor Diaz, P.E.

Design Engineering Manager/VP

Acceptance by

By: _____

Printed Name: _____

Title: _____

Date: _____



City of Port Orange Public Works & Utilities Department

TO: Wayne Clark, City Manager

THRU: Lynn Stevens, Public Works & Utilities Director
Ronny Buttrum, Deputy Director of Public Works

FROM: Julia Wiggins, Public Works & Utilities Business Manager

DATE: April 16, 2021

SUBJECT: DJ Design Services, Inc. – Task Authorization No 14
Fire Station No 74 Ceiling/DAQ Architectural Design Proposal

REQUEST:

The Public Works & Utilities Department is requesting City Council to approve of Task Authorization No 14 to the Master Contract for Architectural Services with DJ Design Services, Inc. for Fire Station No 74 Ceiling Indoor Air Quality Architectural Design Proposal, not to exceed \$30,034.00.

PURPOSE:

The purpose of this request is to maintain City infrastructure to extend the full life of capital investments.

CONSIDERATION:

On March 26, the Building Maintenance Supervisor met with DJ Design, Inc. This meeting was to determine a course of action that the City would need to take to correct the mold issue at Fire Station No 74.

On April 6, 2021, DJ Design, Inc. submitted a proposal for Fire Station No 74 Ceiling Indoor Air Quality Architectural Design. This proposal will assist the City with developing remodeling documents to help solve the moisture and indoor air-quality issues at Fire Station No 74. DJ Design, Inc. will provide architectural, mechanical, and electrical construction drawings.

Task Authorization No 14 will be issued to DJ Design Services, Inc. for the above services for an amount not to exceed \$30,034. On April 6, 2021, Council approved Budget Resolution No 21-15 to provide the necessary funding. The terms are to be 90 days Substantial and 120 for Final Completion from the issuance of a written Notice to Proceed.

FUNDING:

Fund: 506

Fund Name: Building Maintenance

Cost Center: Building Maintenance

Program: None

Spend Category: Building Maintenance and Repairs

Budget: \$100,000

Actual: \$30,034

RECOMMENDATION:

The Public Works & Utilities Department City Council to approve of Task Authorization No 14 to the Master Contract for Architectural Services with DJ Design Services, Inc. for Fire Station No 74 Ceiling Indoor Air Quality Architectural Design Proposal, not to exceed \$30,034.00.

ANTICIPATED SCHEDULE:

a.) Council Approval – May 18, 2021

b.) Executed Task Documents – May 22, 2021

ATTACHMENTS:

a.) Task Authorization Documents

b.) Scope of Services



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 5/18/2021

Consent item: Yes

SUBJECT: (C12) Resolution No. 21-21 - Approving a State-Funded Grant Agreement for FPN 439865-3-34-01, for design of the SUNTrail/St Johns River to Sea Loop Trail

DEPARTMENT: Community Development

GOAL: 2 - Infrastructure, 3 - Quality of Life

RECOMMENDED MOTION: Move to approve Resolution No. 21-21, accepting the State-Funded Grant for the design of the SUNTrail/St Johns River to Sea Loop Trail, subject to State of Florida concurrence and final execution of Agreement; and authorizing the Mayor and City Clerk to execute the State-Funded Grant Agreement and Resolution.

SUMMARY: The following request is to enter into a State-Funded Grant Agreement with the Florida Department of Transportation (FDOT) to reimburse the City for the cost associated to design a segment of the St. Johns River to Sea Loop Trail within Port Orange. The St. Johns River-to-Sea Loop is a 260-mile regional trail system that runs through five Florida counties (Putnam, St. Johns, Volusia, Brevard, and Flagler), includes the entire Palatka-to-St. Augustine State Trail, and is part of the 3,000-mile East Coast Greenway.

In 2020, FDOT completed a Project Development and Environment (PD&E) Study that identified a route to fill a gap in the St. Johns River-to-Sea Loop Trail within South Daytona, Port Orange, Volusia County, and New Smyrna Beach. Based on direction provided by the City Council at their May 28th, 2019 Workshop, the PD&E Study concluded the location of the trail through Port Orange would be along McDonald Road, Spruce Creek Road, and Nova Road and for the most part consist of existing sidewalks. According to the approved FDOT PD&E Study, the trail segment to be designed is to extend along the east side of Spruce Creek Road from the current terminus to Oak Street. However, if acquisition of right-of-way or easement is unsuccessful, then the trail will have a mid-block crossing near Selin Circle and extend along the west side of Spruce Creek Road to Oak Street and then cross back over Spruce Creek Road and continue along the east side of Spruce Creek Road to Dunlawton Avenue. The other segment of the trail to be designed is along the east side of Spruce Creek Road and a City-owned vacant parcel between Dunlawton Avenue and Herbert Street, connecting to the existing trail segment at 6th Street (See Graphic attachment).

The State-Funded Grant Agreement is for \$200,000 which is the estimated cost to design the unbuilt portion of the trail in Port Orange; however FDOT is able to increase

or reduce the funding upon on the actual design contract with the City's selected design consultant. **A budget resolution will be placed on an upcoming City Council agenda to appropriate the \$200,000 for the design of the SUNTrail project.** Staff is currently negotiating with Traffic Engineering Data Solutions (TEDS), on the design proposal and will place the resulting Task Authorization on an upcoming City Council agenda as well.

FDOT has this project scheduled for design in their FY21 and construction in FY23. Therefore, in order to meet the FDOT funding schedule, the City would need to authorize commencement of design in June 2021 and complete the design and construction bid package for FDOT's review by June 2022.

Project No.: 201749

Funding Account No.: N/A

Presenter: Margaret Tomlinson

ATTACHMENTS:

1.	Reso 21-21	Reso 21-21.pdf
2.	State Funded Grant Agreement for FPN 439865-3-34-01 Agreement	State Funded GRant Agreement for FPN 439865-3-34-01 Agreement.pdf
3.	Suntrail SJR2C Loop Trail Concept Plan	Suntrail SJR2C Loop Trail Concept Plan.pdf
4.	Graphic overview of project and City of Port Orange portion of project	Exhibit A.docx

Lisa Epstein	Created/Initiated - 4/14/2021
Tim Burman	Approved - 4/30/2021
Lupe Reyna-Coffin	Approved - 4/30/2021
Scott Neils	Approved - 5/3/2021
Matthew Jones	Approved - 5/6/2021
Wayne Clark	Approved - 5/7/2021
Robin Fenwick	Final Approval - 5/7/2021

RESOLUTION NO. 21-21

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA, ACCEPTING A GRANT FOR FPN 439865-3-34-01, FOR DESIGN OF THE ST. JOHNS RIVER TO SEA LOOP TRAIL (SPRUCE CREEK ROAD) FROM SOUTH OF SELIN CIRCLE TO HERBERT STREET; AUTHORIZING THE MAYOR AND CITY CLERK TO EXECUTE THE STATE-FUNDED GRANT AGREEMENT WITH THE FLORIDA DEPARTMENT OF TRANSPORTATION; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the State of Florida Department of Transportation and the City of Port Orange desire to facilitate the St. Johns River to Sea Loop Trail (Spruce Creek Road) from South of Selin Circle to Herbert Street and,

WHEREAS, the State of Florida Department of Transportation has requested the City of Port Orange to execute and deliver to the State of Florida Department of Transportation the State-Funded Grant Agreement for the aforementioned project, FPN 439865-3-34-01.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA:

Section 1. The City Council of the City of Port Orange, Florida, hereby accepts said grant and authorizes the Mayor and City Clerk to make, execute, and deliver to the State of Florida Department of Transportation the State-Funded Grant Agreement for the aforementioned project, FPN 439865-3-34-01, a copy of which is attached hereto as **Exhibit “1”**.

Section 2. This resolution shall become effective immediately upon adoption.

MAYOR DONALD O. BURNETTE

ATTEST:

Robin L. Fenwick, MMC, City Clerk

Adopted on the day of

Reviewed and Approved: _____
Shannon K. Balmer, Assistant City Attorney

EXHIBIT "1"

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FPN: <u>439865-3-34-01</u>	Fund: <u>TLWR</u> Org Code: <u>55053010541</u>	FLAIR Category: <u>088849</u> FLAIR Obj: <u>751000</u>
FPN: _____	Fund: _____ Org Code: _____	FLAIR Category: _____ FLAIR Obj: _____
FPN: _____	Fund: _____ Org Code: _____	FLAIR Category: _____ FLAIR Obj: _____
County No: <u>79</u>	Contract No: _____	Vendor No: <u>F596-000-412-003</u>

THIS STATE-FUNDED GRANT AGREEMENT ("Agreement") is entered into on _____,

(This date to be entered by DOT only)

by and between the State of Florida Department of Transportation, ("Department"), and the City of Port Orange, ("Recipient"). The

Department and the Recipient are sometimes referred to in this Agreement as a "Party" and collectively as the "Parties".

NOW, THEREFORE, in consideration of the mutual benefits to be derived from joint participation on the Project, the Parties agree to the following:

- 1. Authority:** The Department is authorized to enter into this Agreement pursuant to Sections 334.044, 334.044(7), and *(select the applicable statutory authority for the program(s) below)*:
 - ☐ Section 339.2817 Florida Statutes, County Incentive Grant Program (CIGP), (CSFA 55.008)
 - ☐ Section 339.2818 Florida Statutes, Small County Outreach Program (SCOP), (CSFA 55.009)
 - ☐ Section 339.2816 Florida Statutes, Small County Road Assistance Program (SCRAP), (CSFA 55.016)
 - ☐ Section 339.2819 Florida Statutes, Transportation Regional Incentive Program (TRIP), (CSFA 55.026)
 - ☒ Section 339.81 Florida Statutes , Florida Shared-Use Nonmotorized (SUN) Trail Network Program , (CSFA 55.038)

The Recipient by Resolution or other form of official authorization, a copy of which is attached as **Exhibit "D"**, **Recipient Resolution**, and made a part of this Agreement, has authorized its officers to execute this Agreement on its behalf.

- 2. Purpose of Agreement:** The purpose of this Agreement is to provide for the Department's participation in St. Johns River to Sea Loop Trail (Spruce Creek Road) from South of Selin Circle to Herbert Street, as further described in **Exhibit "A", Project Description and Responsibilities**, attached to and incorporated into this Agreement ("Project"); to provide Department financial assistance to the Recipient; state the terms and conditions upon which Department funds will be provided; and to set forth the manner in which the Project will be undertaken and completed.
- 3. Term of the Agreement, Commencement and Completion of the Project:** This Agreement shall commence upon full execution by both Parties and the Recipient shall complete the Project on or before October 31, 2022. If the Recipient does not complete the Project within this time period, this Agreement will expire on the last day of the scheduled completion as provided in this paragraph unless an extension of the time period is requested by the Recipient and granted in writing by the Department prior to the expiration of this Agreement. Expiration of this Agreement will be considered termination of the Project. The Recipient acknowledges that no funding for the Project will be provided by the State under this Agreement for work on the Project that is not timely completed and invoiced in accordance with the terms of this Agreement, or for work performed prior to full execution of the Agreement. Notwithstanding the expiration of the required completion date provided in this Agreement and the consequent potential unavailability of any unexpended portion of State funding to be provided under this Agreement, the

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Recipient shall remain obligated to complete all aspects of the Project identified in **Exhibit "A"** in accordance with the remaining terms of this Agreement, unless otherwise agreed by the Parties, in writing.

Execution of this Agreement by both Parties shall be deemed a Notice to Proceed to the Recipient for the design phase or other non-construction phases of the Project. If the Project involves a construction phase, the Recipient shall not begin the construction phase of the Project until the Department issues a written Notice to Proceed for the construction phase. Prior to commencing the construction work described in this Agreement, the Recipient shall request a Notice to Proceed from the Department.

- 4. Amendments, Extensions and Assignment:** This Agreement may be amended or extended upon mutual written agreement of the Parties. This Agreement shall not be assigned, transferred or otherwise encumbered by the Recipient under any circumstances without the prior written consent of the Department.
- 5. Termination or Suspension of Project:** The Department may, by written notice to the Recipient, suspend any or all of the Department's obligations under this Agreement for the Recipient's failure to comply with applicable laws or the terms of this Agreement until such time as the event or condition resulting in such suspension has ceased or been corrected. The Department may also terminate this Agreement in whole or in part at any time the interest of the Department requires such termination.
 - a. If the Department terminates the Agreement, the Department shall notify the Recipient of such termination in writing within thirty (30) days of the Department's determination to terminate the Agreement, with instructions as to the effective date of termination or to specify the stage of work at which the Agreement is to be terminated.
 - b. The Parties to this Agreement may also terminate this Agreement when its continuation would not produce beneficial results commensurate with the further expenditure of funds. In this event, the Parties shall agree upon the termination conditions through mutual written agreement.
 - c. If the Agreement is terminated before performance is completed, the Recipient shall be paid only for that work satisfactorily performed for which costs can be substantiated. Such payment, however, may not exceed an amount which is the same percentage of the contract price as the amount of work satisfactorily completed is a percentage of the total work called for by this Agreement. All work in progress on the Department right-of-way will become the property of the Department and will be turned over promptly by the Recipient.
 - d. Upon termination of this Agreement, the Recipient shall, within thirty (30) days, refund to the Department any funds determined by the Department to have been expended in violation of this Agreement.
- 6. Project Cost:**
 - a. The estimated cost of the Project is \$200,000.00 (Two Hundred Thousand Dollars and No/100). This amount is based upon the Schedule of Financial Assistance in **Exhibit "B", Schedule of Financial Assistance**, attached and incorporated in this Agreement. The Schedule of Financial Assistance may be modified by execution of an amendment of the Agreement by the Parties.
 - b. The Department agrees to participate in the Project cost up to the maximum amount of \$200,000.00 (Two Hundred Thousand Dollars and No/100) and, additionally the Department's participation in the Project shall not exceed N/A% of the total cost of the Project, and as more fully described in **Exhibit "B"**. The Department's participation may be increased or reduced upon a determination of the actual bid amounts of the Project by the execution of an amendment. The Recipient agrees to bear all expenses in excess of the amount of the Department's participation and any cost overruns or deficits incurred in connection with completion of the Project.
 - c. The Department's participation in eligible Project costs is subject to, but not limited to:
 - i. Legislative approval of the Department's appropriation request in the work program year that the Project is scheduled to be committed;

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- ii. Approval of all plans, specifications, contracts or other obligating documents and all other terms of this Agreement; and
- iii. Department approval of the Project scope and budget at the time appropriation authority becomes available.

7. Compensation and Payment:

- a. The Department shall reimburse the Recipient for costs incurred to perform services described in the Project Description and Responsibilities in **Exhibit "A"**, and as set forth in the Schedule of Financial Assistance in **Exhibit "B"**.
- b. The Recipient shall provide quantifiable, measurable, and verifiable units of deliverables. Each deliverable must specify the required minimum level of service to be performed and the criteria for evaluating successful completion. The Project and the quantifiable, measurable, and verifiable units of deliverables are described more fully in **Exhibit "A"**, Project Description and Responsibilities. Any changes to the deliverables shall require an amendment executed by both parties.
- c. Invoices shall be submitted no more often than monthly and no less than quarterly by the Recipient in detail sufficient for a proper pre-audit and post-audit, based on the quantifiable, measurable and verifiable deliverables as established in **Exhibit "A"**. Deliverables and costs incurred must be received and approved by the Department prior to reimbursements. Requests for reimbursement by the Recipient shall include an invoice, progress report and supporting documentation for the period of services being billed that are acceptable to the Department. The Recipient shall use the format for the invoice and progress report that is approved by the Department.
- d. Supporting documentation must establish that the deliverables were received and accepted in writing by the Recipient and must also establish that the required minimum standards or level of service to be performed based on the criteria for evaluating successful completion as specified in **Exhibit "A"** has been met. All costs invoiced shall be supported by properly executed payrolls, time records, invoices, contracts or vouchers evidencing in proper detail the nature and propriety of charges as described in **Exhibit "F"**, **Contract Payment Requirements**.
- e. Travel expenses are not compensable under this Agreement.
- f. Payment shall be made only after receipt and approval of deliverables and costs incurred unless advance payments are authorized by the Chief Financial Officer of the State of Florida under Chapters 215 and 216, Florida Statutes or the Department's Comptroller under Section 334.044(29), Florida Statutes.

If the Department determines that the performance of the Recipient is unsatisfactory, the Department shall notify the Recipient of the deficiency to be corrected, which correction shall be made within a time-frame to be specified by the Department. The Recipient shall, within thirty (30) days after notice from the Department, provide the Department with a corrective action plan describing how the Recipient will address all issues of contract non-performance, unacceptable performance, failure to meet the minimum performance levels, deliverable deficiencies, or contract non-compliance. If the corrective action plan is unacceptable to the Department, the Recipient will not be reimbursed to the extent of the non-performance. The Recipient will not be reimbursed until the Recipient resolves the deficiency. If the deficiency is subsequently resolved, the Recipient may bill the Department for the unpaid reimbursement request(s) during the next billing period. If the Recipient is unable to resolve the deficiency, the funds shall be forfeited at the end of the Agreement's term.

Recipients receiving financial assistance from the Department should be aware of the following time frames. Inspection and approval of deliverables and costs incurred shall take no longer than 20 days from the Department's receipt of the invoice. The Department has 20 days to deliver a request for payment (voucher) to the Department of Financial Services. The 20 days are measured from the latter of the date the invoice is received or the deliverables and costs incurred are received, inspected, and approved.

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If a payment is not available within 40 days, a separate interest penalty at a rate as established pursuant to Section 55.03(1), Florida Statutes, will be due and payable, in addition to the invoice amount, to the Recipient. Interest penalties of less than one (1) dollar will not be enforced unless the Recipient requests payment. Invoices that have to be returned to a Recipient because of Recipient preparation errors will result in a delay in the payment. The invoice payment requirements do not start until a properly completed invoice is provided to the Department.

A Vendor Ombudsman has been established within the Department of Financial Services. The duties of this individual include acting as an advocate for Recipient who may be experiencing problems in obtaining timely payment(s) from a state agency. The Vendor Ombudsman may be contacted at (850) 413-5516.

- g.** The Recipient shall maintain an accounting system or separate accounts to ensure funds and projects are tracked separately. Records of costs incurred under the terms of this Agreement shall be maintained and made available upon request to the Department at all times during the period of this Agreement and for five years after final payment is made. Copies of these documents and records shall be furnished to the Department upon request. Records of costs incurred include the Recipient's general accounting records and the project records, together with supporting documents and records, of the contractor and all subcontractors performing work on the project, and all other records of the contractor and subcontractors considered necessary by the Department for a proper audit of costs.
- h. Progress Reports.** Upon request, the Recipient agrees to provide progress reports to the Department in the standard format used by the Department and at intervals established by the Department. The Department will be entitled at all times to be advised, at its request, as to the status of the Project and of details thereof.
- i.** If, after Project completion, any claim is made by the Department resulting from an audit or for work or services performed pursuant to this Agreement, the Department may offset such amount from payments due for work or services done under any agreement which it has with the Recipient owing such amount if, upon demand, payment of the amount is not made within 60 days to the Department. Offsetting any amount pursuant to this paragraph shall not be considered a breach of contract by the Department.
- j.** The Recipient must submit the final invoice on the Project to the Department within 120 days after the completion of the Project. Invoices submitted after the 120-day time period may not be paid.
- k.** The Department's performance and obligation to pay under this Agreement is contingent upon an annual appropriation by the Legislature. If the Department's financial assistance for this Project is in multiple fiscal years, a notice of availability of funds from the Department's project manager must be received prior to costs being incurred by the Recipient. See **Exhibit "B"** for funding levels by fiscal year. Project costs utilizing any fiscal year funds are not eligible for reimbursement if incurred prior to funds approval being received. The Department will notify the Recipient, in writing, when funds are available.
- l.** In the event this Agreement is in excess of \$25,000 and has a term for a period of more than one year, the provisions of Section 339.135(6)(a), Florida Statutes, are hereby incorporated:

"The Department, during any fiscal year, shall not expend money, incur any liability, or enter into any contract which, by its terms, involves the expenditure of money in excess of the amounts budgeted as available for expenditure during such fiscal year. Any contract, verbal or written, made in violation of this subsection is null and void, and no money may be paid on such contract. The Department shall require a statement from the comptroller of the Department that funds are available prior to entering into any such contract or other binding commitment of funds. Nothing herein contained shall prevent the making of contracts for periods exceeding 1 year, but any contract so made shall be executory only for the value of the services to be rendered or agreed to be paid for in succeeding fiscal years, and this paragraph shall be incorporated verbatim in all contracts of the Department which are for an amount in excess of \$25,000 and which have a term for a period of more than 1 year."

- m. Any Project funds made available by the Department pursuant to this Agreement which are determined by the Department to have been expended by the Recipient in violation of this Agreement or any other applicable law or regulation, shall be promptly refunded in full to the Department. Acceptance by the Department of any documentation or certifications, mandatory or otherwise permitted, that the Recipient files shall not constitute a waiver of the Department's rights as the funding agency to verify all information at a later date by audit or investigation.
- n. In determining the amount of the payment, the Department will exclude all Project costs incurred by the Recipient prior to the execution of this Agreement, costs incurred prior to issuance of a Notice to Proceed, costs incurred after the expiration of the Agreement, costs which are not provided for in the latest approved Schedule of Financial Assistance in **Exhibit "B"** for the Project, costs agreed to be borne by the Recipient or its contractors and subcontractors for not meeting the Project commencement and final invoice time lines, and costs attributable to goods or services received under a contract or other arrangements which have not been approved in writing by the Department.

8. General Requirements:

The Recipient shall complete the Project with all practical dispatch in a sound, economical, and efficient manner, and in accordance with the provisions in this Agreement and all applicable laws.

- a. The Recipient must obtain written approval from the Department prior to performing itself (through the efforts of its own employees) any aspect of the Project that will be funded under this Agreement.
 - ☐ If this box is checked, then the Agency is permitted to utilize its own forces and the following provision applies: **Use of Agency Workforce**. In the event the Agency proceeds with any phase of the Project utilizing its own forces, the Agency will only be reimbursed for direct costs (this excludes general overhead).
- b. The Recipient shall provide to the Department certification and a copy of appropriate documentation substantiating that all required right-of-way necessary for the Project has been obtained. Certification is required prior to authorization for advertisement for or solicitation of bids for construction of the Project, including if no right-of-way is required.
- c. The Recipient shall comply and require its contractors and subcontractors to comply with all terms and conditions of this Agreement and all federal, state, and local laws and regulations applicable to this Project.
- d. The Recipient shall have the sole responsibility for resolving claims and requests for additional work for the Project by the Recipient's contractors and consultants. No funds will be provided for payment of claims or additional work on the Project under this Agreement without the prior written approval of the claim or request for additional work by Department.

9. Contracts of the Recipient

- a. The Department has the right to review and approve any and all third party contracts with respect to the Project before the Recipient executes any contract or obligates itself in any manner requiring the disbursement of Department funds under this Agreement, including consultant or construction contracts or amendments thereto. If the Department exercises this right and the Recipient fails to obtain such approval, the Department may deny payment to the Recipient. The Department may review the qualifications of any consultant or contractor and to approve or disapprove the employment of such consultant or contractor.
- b. It is understood and agreed by the parties hereto that participation by the Department in a project that involves the purchase of commodities or contractual services or the purchasing of capital equipment or the equipping of facilities, where purchases or costs exceed the Threshold Amount for CATEGORY TWO per Chapter 287.017 Florida Statutes, is contingent on the Recipient complying in full with the provisions of Chapter 287.057 Florida Statutes. The Recipient shall certify to the Department that the purchase of commodities or contractual services has been accomplished in compliance with Chapter 287.057 Florida Statutes. It shall be the sole responsibility of the Recipient to ensure that any obligations made in accordance with this Section comply with the current threshold limits. Contracts, purchase orders, task orders,

construction change orders, or any other agreement that would result in exceeding the current budget contained in **Exhibit "B"**, or that are not consistent with the Project description and scope of services contained in **Exhibit "A"** must be approved by the Department prior to Recipient execution. Failure to obtain such approval, and subsequent execution of an amendment to the Agreement if required, shall be sufficient cause for nonpayment by the Department.

- c. Participation by the Department in a project that involves a consultant contract for engineering, architecture or surveying services, is contingent on the Recipient's complying in full with provisions of Section 287.055, Florida Statutes, Consultants' Competitive Negotiation Act. In all cases, the Recipient shall certify to the Department that selection has been accomplished in compliance with the Consultants' Competitive Negotiation Act.
- d. If the Project is procured pursuant to Chapter 255 for construction services and at the time of the competitive solicitation for the Project 50 percent or more of the cost of the Project is to be paid from state-appropriated funds, then the Recipient must comply with the requirements of Section 255.0991, Florida Statutes.

10. Design and Construction Standards and Required Approvals: In the event the Project includes construction the following provisions are incorporated into this Agreement:

- a. The Recipient is responsible for obtaining all permits necessary for the Project.
- b. In the event the Project involves construction on the Department's right-of-way, the Recipient shall provide the Department with written notification of either its intent to:
 - i. Award the construction of the Project to a Department prequalified contractor which is the lowest and best bidder in accordance with applicable state and federal statutes, rules, and regulations. The Recipient shall then submit a copy of the bid tally sheet(s) and awarded bid contract, or
 - ii. Construct the Project utilizing existing Recipient employees, if the Recipient can complete said Project within the time frame set forth in this Agreement. The Recipient's use of this option is subject to approval by the Department.
- c. The Recipient shall hire a qualified contractor using the Recipient's normal bid procedures to perform the construction work for the Project. For projects that are not located on the Department's right-of-way, the Recipient is not required to hire a contractor prequalified by the Department unless the Department notifies the Recipient prior to letting that they are required to hire a contractor prequalified by the Department.
- d. The Recipient is responsible for provision of Construction Engineering Inspection (CEI) services. The Department reserves the right to require the Recipient to hire a Department pre-qualified consultant firm that includes one individual that has completed the Advanced Maintenance of Traffic Level Training. Notwithstanding any provision of law to the contrary, design services and CEI services may not be performed by the same entity. Administration of the CEI staff shall be under the responsible charge of a State of Florida Licensed Professional Engineer who shall provide the certification that all design and construction for the Project meets the minimum construction standards established by Department. The Department shall have the right to approve the CEI firm. The Department shall have the right, but not the obligation, to perform independent assurance testing during the course of construction of the Project. Subject to the approval of the Department, the Recipient may choose to satisfy the requirements set forth in this paragraph by either hiring a Department prequalified consultant firm or utilizing Recipient staff that meet the requirements of this paragraph, or a combination thereof.
- e. The Recipient is responsible for the preparation of all design plans for the Project. The Department reserves the right to require the Recipient to hire a Department pre-qualified consultant for the design phase of the Project using the Recipient's normal procurement procedures to perform the design services for the Project. Notwithstanding any provision of law to the contrary, design services and CEI services may not be performed by the same entity. All design work on the Project shall be performed in accordance with the requirements of all applicable laws and governmental rules and regulations and federal and state accepted design standards for the type of construction contemplated by the Project, including, as applicable, but not

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limited to, the applicable provisions of the Manual of Uniform Traffic Control Devices (MUTCD) and the AASHTO Policy on Geometric Design of Streets and Highways. If any portion of the Project will be located on, under, or over any Department-owned right-of-way, the Department shall review the Project's design plans for compliance with all applicable standards of the Department, as provided in **Exhibit "O", Terms and Conditions of Construction**, which is attached to and incorporated into this Agreement.

- f. The Recipient shall adhere to the Department's Conflict of Interest Procedure (FDOT Topic No. 375-030-006).
- g. The Recipient will provide copies of the final design plans and specifications and final bid documents to the Department's Construction Project Manager prior to commencing construction of the Project. The Department will specify the number of copies required and the required format.
- h. The Recipient shall require the Recipient's contractor to post a payment and performance bond in accordance with applicable law.
- i. The Recipient shall be responsible to ensure that the construction work under this Agreement is performed in accordance with the approved construction documents, and that it will meet all applicable Recipient and Department standards.
- j. Upon completion of the work authorized by this Agreement, the Recipient shall notify the Department in writing of the completion of construction of the Project; and for all design work that originally required certification by a Professional Engineer, this notification shall contain an Engineers Certification of Compliance, signed and sealed by a Professional Engineer, the form of which is attached hereto and incorporated herein as **Exhibit "C", Engineers Certification of Completion**. The certification shall state that work has been completed in compliance with the Project construction plans and specifications. If any deviations are found from the approved plans, the certification shall include a list of all deviations along with an explanation that justifies the reason to accept each deviation.
- k. The Recipient shall provide the Department with as-built plans of any portions of the Project funded through the Agreement prior to final inspection.

11. Maintenance Obligations: In the event the Project includes construction then the following provisions are incorporated into this Agreement:

- a. The Recipient agrees to maintain any portion of the Project not located on the State Highway System constructed under this Agreement for its useful life. If the Recipient constructs any improvement on Department right-of-way, the Recipient

☒ shall

☐ shall not

maintain the improvements located on the Department right-of-way made for their useful life. If the Recipient is required to maintain Project improvements located on the Department right-of-way beyond final acceptance, then Recipient shall, prior to any disbursement of the State funding provided under this Agreement, also execute a Maintenance Memorandum of Agreement in a form that is acceptable to the Department. The Recipient has agreed to the foregoing by resolution, and such resolution is attached and incorporated into this Agreement as **Exhibit "D"**. This provision will survive termination of this Agreement.

12. State Single Audit: The administration of resources awarded through the Department to the Recipient by this Agreement may be subject to audits and/or monitoring by the Department. The following requirements do not limit the authority of the Department to conduct or arrange for the conduct of additional audits or evaluations of state financial assistance or limit the authority of any state agency inspector general, the Auditor General, or any other state official. The Recipient shall comply with all audit and audit reporting requirements as specified below.

- a. In addition to reviews of audits conducted in accordance with Section 215.97, Florida Statutes, monitoring procedures to monitor the Recipient's use of state financial assistance may include but not be limited to on-site visits by Department staff and/or other procedures including, reviewing any required performance and

financial reports, following up, ensuring corrective action, and issuing management decisions on weaknesses found through audits when those findings pertain to state financial assistance awarded through the Department by this Agreement. By entering into this Agreement, the Recipient agrees to comply and cooperate fully with any monitoring procedures/processes deemed appropriate by the Department. The Recipient further agrees to comply and cooperate with any inspections, reviews, investigations, or audits deemed necessary by the Department, the Department of Financial Services (DFS) or the Auditor General.

- b. The Recipient, a nonstate entity as defined by Section 215.97(2)(n), Florida Statutes, as a recipient of state financial assistance awarded by the Department through this Agreement is subject to the following requirements:
- i. In the event the Recipient meets the audit threshold requirements established by Section 215.97, Florida Statutes, the Recipient must have a State single or project-specific audit conducted for such fiscal year in accordance with Section 215.97, Florida Statutes; applicable rules of the Department of Financial Services; and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General. **Exhibit "J", State Financial Assistance (Florida Single Audit Act)** to this Agreement indicates state financial assistance awarded through the Department by this Agreement needed by the Recipient to further comply with the requirements of Section 215.97, Florida Statutes. In determining the state financial assistance expended in a fiscal year, the Recipient shall consider all sources of state financial assistance, including state financial assistance received from the Department by this Agreement, other state agencies and other nonstate entities. State financial assistance does not include Federal direct or pass-through awards and resources received by a nonstate entity for Federal program matching requirements.
 - ii. In connection with the audit requirements, the Recipient shall ensure that the audit complies with the requirements of Section 215.97(8), Florida Statutes. This includes submission of a financial reporting package as defined by Section 215.97(2)(e), Florida Statutes, and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General.
 - iii. In the event the Recipient does not meet the audit threshold requirements established by Section 215.97, Florida Statutes, the Recipient is exempt for such fiscal year from the state single audit requirements of Section 215.97, Florida Statutes. However, the Recipient must provide a single audit exemption statement to the Department at FDOTSingleAudit@dot.state.fl.us no later than nine months after the end of the Recipient's audit period for each applicable audit year. In the event the Recipient does not meet the audit threshold requirements established by Section 215.97, Florida Statutes, in a fiscal year and elects to have an audit conducted in accordance with the provisions of Section 215.97, Florida Statutes, the cost of the audit must be paid from the Recipient's resources (i.e., the cost of such an audit must be paid from the Recipient's resources obtained from other than State entities).
 - iv. In accordance with Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, copies of financial reporting packages required by this Agreement shall be submitted to:

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Florida Department of Transportation
Office of Comptroller, MS 24
605 Suwannee Street
Tallahassee, FL 32399-0405
Email: FDOTSingleAudit@dot.state.fl.us

And

State of Florida Auditor General
Local Government Audits/342
111 West Madison Street, Room 401
Tallahassee, FL 32399-1450
Email: flaudgen_localgovt@aud.state.fl.us

- v. Any copies of financial reporting packages, reports or other information required to be submitted to the Department shall be submitted timely in accordance with Section 215.97, Florida Statutes, and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, as applicable.
 - vi. The Recipient, when submitting financial reporting packages to the Department for audits done in accordance with Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, should indicate the date the reporting package was delivered to the Recipient in correspondence accompanying the reporting package.
 - vii. Upon receipt, and within six months, the Department will review the Recipient's financial reporting package, including corrective action plans and management letters, to the extent necessary to determine whether timely and appropriate corrective action on all deficiencies has been taken pertaining to the state financial assistance provided through the Department by this Agreement. If the Recipient fails to have an audit conducted consistent with Section 215.97, Florida Statutes, the Department may take appropriate corrective action to enforce compliance.
 - viii. As a condition of receiving state financial assistance, the Recipient shall permit the Department, or its designee, DFS or the Auditor General access to the Recipient's records including financial statements, the independent auditor's working papers and project records as necessary. Records related to unresolved audit findings, appeals or litigation shall be retained until the action is complete or the dispute is resolved.
- c. The Recipient shall retain sufficient records demonstrating its compliance with the terms of this Agreement for a period of five years from the date the audit report is issued and shall allow the Department, or its designee, DFS or the Auditor General access to such records upon request. The Recipient shall ensure that the audit working papers are made available to the Department, or its designee, DFS or the Auditor General upon request for a period of five years from the date the audit report is issued unless extended in writing by the Department.

13. Restrictions, Prohibitions, Controls and Labor Provisions:

- a. A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity; may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.
- b. In accordance with Section 287.134, Florida Statutes, an entity or affiliate who has been placed on the Discriminatory Vendor List, kept by the Florida Department of Management Services, may not submit a bid on a contract to provide goods or services to a public entity; may not submit a bid on a contract with a public

entity for the construction or repair of a public building or public work; may not submit bids on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor or consultant under a contract with any public entity; and may not transact business with any public entity.

- c. An entity or affiliate who has had its Certificate of Qualification suspended, revoked, denied or have further been determined by the Department to be a non-responsible contractor may not submit a bid or perform work for the construction or repair of a public building or public work on a contract with the Recipient.
- d. No funds received pursuant to this Agreement may be expended for lobbying the Florida Legislature, judicial branch, or any state agency, in accordance with Section 216.347, Florida Statutes.
- e. The Department shall consider the employment by any contractor of unauthorized aliens a violation of Section 274A(e) of the Immigration and Nationality Act. If the contractor knowingly employs unauthorized aliens, such violation will be cause for unilateral cancellation of this Agreement.
- f. The Recipient shall:
 - i. Utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Recipient during the term of the contract; and
 - ii. Expressly require any subcontractors performing work or providing services pursuant to the state contract to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the contract term.
- g. The Recipient shall comply and require its contractors and subcontractors to comply with all terms and conditions of this Agreement and all federal, state, and local laws and regulations applicable to this Project.

14. Indemnification and Insurance:

- a. It is specifically agreed between the parties executing this Agreement that it is not intended by any of the provisions of any part of this Agreement to create in the public or any member thereof, a third-party beneficiary under this Agreement, or to authorize anyone not a party to this Agreement to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this Agreement. The Recipient guarantees the payment of all just claims for materials, supplies, tools, or labor and other just claims against the Recipient or any subcontractor, in connection with this Agreement.
- b. To the extent provided by law, Recipient shall indemnify, defend, and hold harmless the Department against any actions, claims, or damages arising out of, relating to, or resulting from negligent or wrongful act(s) of Recipient, or any of its officers, agents, or employees, acting within the scope of their office or employment, in connection with the rights granted to or exercised by Recipient hereunder, to the extent and within the limitations of Section 768.28, Florida Statutes. The foregoing indemnification shall not constitute a waiver of sovereign immunity beyond the limits set forth in Florida Statutes, Section 768.28, nor shall the same be construed to constitute agreement by Recipient to indemnify the Department for the negligent acts or omissions of the Department, its officers, agents, or employees, or for the acts of third parties. Nothing herein shall be construed as consent by Recipient to be sued by third parties in any manner arising out of this Agreement. This indemnification shall survive the termination of this Agreement.
- c. Recipient agrees to include the following indemnification in all contracts with contractors, subcontractors, consultants, or subconsultants (each referred to as "Entity" for the purposes of the below indemnification) who perform work in connection with this Agreement:

"To the extent provided by law, [ENTITY] shall indemnify, defend, and hold harmless the [RECIPIENT] and the State of Florida, Department of Transportation, including the Department's officers, agents, and employees, against any actions, claims, or damages arising out of, relating to, or resulting from negligent or wrongful act(s) of [ENTITY], or any of its officers, agents, or employees, acting within the scope of their office or employment, in connection with the rights

granted to or exercised by [ENTITY] hereunder, to the extent and within the limitations of Section 768.28, Florida Statutes.

The foregoing indemnification shall not constitute a waiver of sovereign immunity beyond the limits set forth in Florida Statutes, Section 768.28. Nor shall the same be construed to constitute agreement by [ENTITY] to indemnify [RECIPIENT] for the negligent acts or omissions of [RECIPIENT], its officers, agents, or employees, or third parties. Nor shall the same be construed to constitute agreement by [ENTITY] to indemnify the Department for the negligent acts or omissions of the Department, its officers, agents, or employees, or third parties. This indemnification shall survive the termination of this Agreement.”

- d. The Recipient shall provide Workers’ Compensation Insurance in accordance with Florida’s Workers’ Compensation law for all employees. If subletting any of the work, ensure that the subcontractor(s) and subconsultants have Workers’ Compensation Insurance for their employees in accordance with Florida’s Workers’ Compensation law. If using “leased employees” or employees obtained through professional employer organizations (“PEO’s”), ensure that such employees are covered by Workers’ Compensation insurance through the PEO’s or other leasing entities. Ensure that any equipment rental agreements that include operators or other personnel who are employees of independent contractors, sole proprietorships or partners are covered by insurance required under Florida’s Workers’ Compensation law.
- e. If the Recipient elects to self-perform the Project, and such self-performance is approved by the Department in accordance with the terms of this Agreement, the Recipient may self-insure and proof of self-insurance shall be provided to the Department. If the Recipient elects to hire a contractor or consultant to perform the Project, then the Recipient shall, or cause its contractor or consultant to carry Commercial General Liability insurance providing continuous coverage for all work or operations performed under the Agreement. Such insurance shall be no more restrictive than that provided by the latest occurrence form edition of the standard Commercial General Liability Coverage Form (ISO Form CG 00 01) as filed for use in the State of Florida. Recipient shall, or cause its contractor to cause the Department to be made an Additional Insured as to such insurance. Such coverage shall be on an “occurrence” basis and shall include Products/Completed Operations coverage. The coverage afforded to the Department as an Additional Insured shall be primary as to any other available insurance and shall not be more restrictive than the coverage afforded to the Named Insured. The limits of coverage shall not be less than \$1,000,000 for each occurrence and not less than a \$5,000,000 annual general aggregate, inclusive of amounts provided by an umbrella or excess policy. The limits of coverage described herein shall apply fully to the work or operations performed under the Agreement, and may not be shared with or diminished by claims unrelated to the Agreement. The policy/ies and coverage described herein may be subject to a deductible and such deductibles shall be paid by the Named Insured. No policy/ies or coverage described herein may contain or be subject to a Retention or a Self-Insured Retention unless the Recipient is a state agency or subdivision of the State of Florida that elects to self-perform the Project. Prior to the execution of the Agreement, and at all renewal periods which occur prior to final acceptance of the work, the Department shall be provided with an ACORD Certificate of Liability Insurance reflecting the coverage described herein. The Department shall be notified in writing within ten days of any cancellation, notice of cancellation, lapse, renewal, or proposed change to any policy or coverage described herein. The Department’s approval or failure to disapprove any policy/ies, coverage, or ACORD Certificates shall not relieve or excuse any obligation to procure and maintain the insurance required herein, nor serve as a waiver of any rights or defenses the Department may have.
- f. When the Agreement includes the construction of a railroad grade crossing, railroad overpass or underpass structure, or any other work or operations within the limits of the railroad right-of-way, including any encroachments thereon from work or operations in the vicinity of the railroad right-of-way, the Recipient shall, or cause its contractor to, in addition to the insurance coverage required above, procure and maintain Railroad Protective Liability Coverage (ISO Form CG 00 35) where the railroad is the Named Insured and where the limits are not less than \$2,000,000 combined single limit for bodily injury and/or property damage per occurrence, and with an annual aggregate limit of not less than \$6,000,000. The railroad shall also be added along with the Department as an Additional Insured on the policy/ies procured pursuant to the paragraph above. Prior to the execution of the Agreement, and at all renewal periods which occur prior to final acceptance of the work, both the Department and the railroad shall be provided with an ACORD Certificate of Liability Insurance reflecting the coverage described herein. The insurance described herein

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shall be maintained through final acceptance of the work. Both the Department and the railroad shall be notified in writing within ten days of any cancellation, notice of cancellation, renewal, or proposed change to any policy or coverage described herein. The Department's approval or failure to disapprove any policy/ies, coverage, or ACORD Certificates shall not relieve or excuse any obligation to procure and maintain the insurance required herein, nor serve as a waiver of any rights the Department may have.

- g.** When the Agreement involves work on or in the vicinity of utility-owned property or facilities, the utility shall be added along with the Department as an Additional Insured on the Commercial General Liability policy/ies procured above.

15. Miscellaneous:

- a.** In no event shall any payment to the Recipient constitute or be construed as a waiver by the Department of any breach of covenant or any default which may then exist on the part of the Recipient and the making of such payment by the Department, while any such breach or default shall exist, shall in no way impair or prejudice any right or remedy available to the Department with respect to such breach or default.
- b.** If any provision of this Agreement is held invalid, the remainder of this Agreement shall not be affected. In such an instance, the remainder would then continue to conform to the terms and requirements of applicable law.
- c.** The Recipient and the Department agree that the Recipient, its employees, contractors, subcontractors, consultants, and subconsultants are not agents of the Department as a result of this Agreement.
- d.** By execution of the Agreement, the Recipient represents that it has not paid and, also agrees not to pay, any bonus or commission for the purpose of obtaining an approval of its application for the financing hereunder.
- e.** Nothing in the Agreement shall require the Recipient to observe or enforce compliance with any provision or perform any act or do any other thing in contravention of any applicable state law. If any of the provisions of the Agreement violate any applicable state law, the Recipient will at once notify the Department in writing in order that appropriate changes and modifications may be made by the Department and the Recipient to the end that the Recipient may proceed as soon as possible with the Project.
- f.** This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which shall constitute the same Agreement. A facsimile or electronic transmission of this Agreement with a signature on behalf of a party will be legal and binding on such party.
- g.** The Department reserves the right to unilaterally terminate this Agreement for failure by the Recipient to comply with the provisions of Chapter 119, Florida Statutes.
- h.** The Recipient agrees to comply with Section 20.055(5), Florida Statutes, and to incorporate in all subcontracts the obligation to comply with Section 20.055(5), Florida Statutes
- i.** This Agreement shall be governed by and construed in accordance with the laws of the State of Florida. In the event of a conflict between any portion of the contract and Florida law, the laws of Florida shall prevail. The Recipient agrees to waive forum and venue and that the Department shall determine the forum and venue in which any dispute under this Agreement is decided.
- j.** This Agreement does not involve the purchase of Tangible Personal Property, as defined in Chapter 273, Florida Statutes.

16. Exhibits.

- a.** **Exhibits A, B, D, F, and J** are attached to and incorporated into this Agreement.
- b.** ☐ The Project will involve construction, therefore, **Exhibit "C"**, Engineer's Certification of Compliance is attached and incorporated into this Agreement.

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- c. ☐ Alternative Advance Payment Financial Provisions are used on this Project. If an Alternative Pay Method is used on this Project, then **Exhibit "H"**, Alternative Advance Payment Financial Provisions, is attached and incorporated into this Agreement.
- d. ☐ This Project utilizes Advance Project Reimbursement. If this Project utilizes Advance Project Reimbursement, then **Exhibit "K"**, Advance Project Reimbursement is attached and incorporated into this Agreement.
- e. ☒ A portion or all of the Project will utilize the Department's right-of-way and, therefore, **Exhibit O, Terms and Conditions of Construction in Department Right-of-Way**, is attached and incorporated into this Agreement.
- f. ☐ The following Exhibit(s), in addition to those listed in 16.a. through 16.f., are attached and incorporated into this Agreement: _____

g. Exhibit and Attachment List

Exhibit A: Project Description and Responsibilities

Exhibit B: Schedule of Financial Assistance

*Exhibit C: Engineer's Certification of Compliance

Exhibit D: Recipient Resolution

Exhibit F: Contract Payment Requirements

*Exhibit H: Alternative Advance Payment Financial Provisions

Exhibit J: State Financial Assistance (Florida Single Audit Act)

*Exhibit K: Advance Project Reimbursement

*Exhibit O: Terms and Conditions of Construction in Department Right-of-Way

*Additional Exhibit(s): _____

*Indicates that the Exhibit is only attached and incorporated if applicable box is selected.

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IN WITNESS WHEREOF, the Parties have executed this Agreement on the day and year written above.

RECIPIENT CITY OF PORT ORANGE

STATE OF FLORIDA,
DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

Title: _____

By: _____

Name: Loreen C. Bobo, P.E.

Title: Director of Transportation Development

Legal Review:

By: _____

Name: _____

EXHIBIT A**PROJECT DESCRIPTION AND RESPONSIBILITIES**FPN: 439865-3-34-01

This exhibit forms an integral part of the Local Agency Program Agreement between the State of Florida, Department of Transportation and

the City of Port Orange (the Recipient)

PROJECT LOCATION:

☐ The project is on the National Highway System.

☒ The project is on the State Highway System.

PROJECT LENGTH AND MILE POST LIMITS: See Project Description Below

PROJECT DESCRIPTION:

This SunTrail project is located within the City of Port Orange and is part of the St. Johns River to Sea Loop Trail system. This segment, of the much larger trail system, begins south of the intersection of Spruce Creek Road and Selin Circle. The trail will extend northerly along the east side of Spruce Creek Road towards Oak Street. In the event acquisition of right-of-way or easement is unsuccessful, then the trail will extend northerly along the west side of Spruce Creek Road towards Oak Street and cross over Spruce Creek Road and continue along the east side of Halifax Canal from Oak Street to Dunlawton Avenue utilizing the existing 8' wide trail. The proposed trail will then continue along Spruce Creek Road from Dunlawton Avenue to Canal View Boulevard. The proposed trail continues through a vacant parcel to Herbert Street, connecting to the existing trail segment. Total project length is approximately 0.652 miles. Within the vacant parcel, owned by the City of Port Orange, an eight-foot wide, 300-foot long boardwalk is proposed in the wetland area. The entire length of the proposed sidewalk is located within the special flood hazard area and floodplain impacts and compensatory storage calculations and design will be required.

Project scope includes design of trail and lighting improvements along the trail route to enhance safety, particularly at points of conflict such as at driveways and roadway crossings. Design services shall include topographic/boundary survey, geotechnical investigations, environmental assessment(s), and engineering design. Utility coordination will be required. Coordination for permitting needs are anticipated. Right of way acquisition or any easement/easement modifications may be required and will be determined during the design phase. All pedestrian accommodations shall adhere to current ADA standards. Design of this trail shall follow the PD&E study finalized in April 2020. In addition, the SunTrail width will need to follow the latest FDOT Design Manual criteria, per Section 224.4, Widths. If a variance for the SunTrail width is needed, it will be coordinated with the Department.

SPECIAL CONSIDERATIONS BY RECIPIENT:

The Recipient is required to provide a copy of the design plans for the Department's review and approval to coordinate permitting with the Department, and notify the Department prior to commencement of any right-of-way activities.

If and when real property rights are to be acquired for a transportation facility, a scaled drawing must be prepared to clearly show the right-of-way to be acquired. It must show sufficient technical data, including land ties, to permit the preparation of legal descriptions for use in acquisition documents, and serve as an aid in appraisal and acquisition. It is supported by a Control Survey Map (certified survey) and does not purport to be a survey. This map provides the certified survey support

for the preparation of right of way related maps and is a depiction of the right of way survey field work performed for a specific transportation project.

Invoices, progress reports and other supporting documentation shall be submitted no more than monthly and no less than quarterly to D5-LocalPrograms@dot.state.fl.us

Pursuant to the enabling legislation, Section 339.81, F.S., components of the Sun Trail Network will not include:

Sidewalks; nature trails; loop trails wholly within a single park or natural area;
On-road facilities, such as bicycle lanes of routes other than on-road facilities that are no longer than one-half mile connecting two or more non-motorized trails, if the provision of non-road facilities is infeasible and if such on-road facilities are signed and marked for non-motorized use; an exception is made for on-road components of the Florida Keys Overseas Heritage Trail.

Allocation of Sun Trail funds will not include the development of amenities associated with trail projects. These amenities include but are not limited to:

- Benches, Trail Furniture or Seating Areas;
- Bicycle Racks, Air Stations or Lockers;
- Buildings, Restrooms, Wayside Structures or Overlooks, Shelters or Picnic Pavilions;
- Kiosks (Regulatory and Safety Signage Permitted);
- Landscaping (Trail Stabilization Permitted);
- Litter or Recycle Receptacles or Doggie Bag Dispensers;
- Parking Areas or Trailheads;
- Playgrounds, Fitness Equipment or Structures;
- Promotional or Educational Materials;
- Sculptures, Fountains, or Art; and
- Water Fountains, Spigots or Showers.

The Recipient shall commence the project's activities subsequent to the execution of this Agreement and shall perform in accordance with the following schedule:

- a) 30% Plans Submittal to be completed by October 18, 2021.
- b) 60% Plans Submittal to be completed by February 21, 2022.
- c) 90% Plans Submittal to be completed by April 25, 2022.
- d) Final Plans Submittal to be completed by June 21, 2022.

If this schedule cannot be met, the Recipient will notify the Department in writing with a revised schedule or the project is subject to the withdrawal of funding.

SPECIAL CONSIDERATIONS BY DEPARTMENT:

In the event the Project costs exceed the cost included in Exhibit "B", Schedule of Financial Assistance, the Recipient will be solely responsible to provide the additional funds that are necessary to complete the Project.

The project funding may be reduced to an amount equal to the award amount and/or the actual contract costs.

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STATE-FUNDED GRANT AGREEMENT

EXHIBIT B
SCHEDULE OF FINANCIAL ASSISTANCE

RECIPIENT NAME & BILLING ADDRESS: City of Port Orange 1000 City Center Circle Port Orange, Florida 32129	FINANCIAL PROJECT NUMBER: 439865-3-34-01
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I. PHASE OF WORK by Fiscal Year:	FY 2020/2021	FY	FY	TOTAL
Design- Phase 34	\$ 200,000.00	\$ 0.00	\$ 0.00	\$200,000.00
Maximum Department Participation - (TLWR)	N/A% or \$ 200,000.00	N/A% or \$ 0.00	N/A% or \$ 0.00	N/A% or \$ 200,000.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	N/A% or \$ 0.00	N/A% or \$ 0.00	N/A% or \$ 0.00	N/A% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00
Right of Way- Phase 44	\$ 0.00	\$ 0.00	\$ 0.00	\$0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	% or \$ 0.00	% or \$ 0.00	% or \$ 0.00	% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00
Construction/CEI - Phase 54	\$ 0.00	\$ 0.00	\$ 0.00	\$0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	% or \$ 0.00	% or \$ 0.00	% or \$ 0.00	% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00

Insert Phase and Number (if applicable)	\$ 0.00	\$ 0.00	\$ 0.00	\$0.00
Maximum Department Participation - (<u>Insert Program Name</u>)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (<u>Insert Program Name</u>)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (<u>Insert Program Name</u>)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	% or \$ 0.00	% or \$ 0.00	% or \$ 0.00	% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00
II. TOTAL PROJECT COST:	\$200,000.00	\$0.00	\$0.00	\$200,000.00

COST ANALYSIS CERTIFICATION AS REQUIRED BY SECTION 216.3475, FLORIDA STATUTES:

I certify that the cost for each line item budget category has been evaluated and determined to be allowable, reasonable, and necessary as required by Section 216.3475, F.S. Documentation is on file evidencing the methodology used and the conclusions reached.

Amir Asgarinik

District Grant Manager Name

Signature

Date

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STATE-FUNDED GRANT AGREEMENT

EXHIBIT D

RECIPIENT RESOLUTION

The Recipient's Resolution authorizing entry into this Agreement is attached and incorporated into this Agreement.

EXHIBIT F**CONTRACT PAYMENT REQUIREMENTS****Florida Department of Financial Services, Reference Guide for State Expenditures
Cost Reimbursement Contracts**

Invoices for cost reimbursement contracts must be supported by an itemized listing of expenditures by category (salary, travel, expenses, etc.). Supporting documentation shall be submitted for each amount for which reimbursement is being claimed indicating that the item has been paid. Documentation for each amount for which reimbursement is being claimed must indicate that the item has been paid. Check numbers may be provided in lieu of copies of actual checks. Each piece of documentation should clearly reflect the dates of service. Only expenditures for categories in the approved agreement budget may be reimbursed. These expenditures must be allowable (pursuant to law) and directly related to the services being provided.

Listed below are types and examples of supporting documentation for cost reimbursement agreements:

Salaries: Timesheets that support the hours worked on the project or activity must be kept. A payroll register, or similar documentation should be maintained. The payroll register should show gross salary charges, fringe benefits, other deductions and net pay. If an individual for whom reimbursement is being claimed is paid by the hour, a document reflecting the hours worked times the rate of pay will be acceptable.

Fringe benefits: Fringe benefits should be supported by invoices showing the amount paid on behalf of the employee, e.g., insurance premiums paid. If the contract specifically states that fringe benefits will be based on a specified percentage rather than the actual cost of fringe benefits, then the calculation for the fringe benefits amount must be shown. Exception: Governmental entities are not required to provide check numbers or copies of checks for fringe benefits.

Travel: Reimbursement for travel must be in accordance with s. 112.061, F.S., which includes submission of the claim on the approved state travel voucher along with supporting receipts and invoices.

Other direct costs: Reimbursement will be made based on paid invoices/receipts and proof of payment processing (cancelled/processed checks and bank statements). If nonexpendable property is purchased using state funds, the contract should include a provision for the transfer of the property to the State when services are terminated. Documentation must be provided to show compliance with DMS Rule 60A-1.017, F.A.C., regarding the requirements for contracts which include services and that provide for the contractor to purchase tangible personal property as defined in s. 273.02, F.S., for subsequent transfer to the State.

Indirect costs: If the contract stipulates that indirect costs will be paid based on a specified rate, then the calculation should be shown. Indirect costs must be in the approved agreement budget and the entity must be able to demonstrate that the costs are not duplicated elsewhere as direct costs. All indirect cost rates must be evaluated for reasonableness and for allowability and must be allocated consistently.

Contracts between state agencies may submit alternative documentation to substantiate the reimbursement request, which may be in the form of FLAIR reports or other detailed reports.

The Florida Department of Financial Services, online Reference Guide for State Expenditures can be found at this web address <https://www.myfloridacfo.com/Division/AA/Manuals/documents/ReferenceGuideforStateExpenditures.pdf>.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STATE-FUNDED GRANT AGREEMENT**EXHIBIT J****STATE FINANCIAL ASSISTANCE (FLORIDA SINGLE AUDIT ACT)****THE STATE RESOURCES AWARDED PURSUANT TO THIS AGREEMENT CONSIST OF THE FOLLOWING:****Awarding Agency:** Florida Department of Transportation**State Project Title
and CSFA
Number:**

- ☐ County Incentive Grant Program (CIGP), (CSFA 55.008)
- ☐ Small County Outreach Program (SCOP), (CSFA 55.009)
- ☐ Small County Road Assistance Program (SCRAP), (CSFA 55.016)
- ☐ Transportation Regional Incentive Program (TRIP), (CSFA 55.026)
- ☒ Florida Shared-Use Nonmotorized (SUN) Trail Network Program,
(CSFA 55.038)

***Award Amount:** \$200,000.00

*The state award amount may change with supplemental agreements

Specific project information for CSFA Number is provided at: <https://apps.fldfs.com/fsaa/searchCatalog.aspx>**COMPLIANCE REQUIREMENTS APPLICABLE TO STATE RESOURCES AWARDED PURSUANT TO THIS AGREEMENT:**State Project Compliance Requirements for CSFA Number are provided at:
<https://apps.fldfs.com/fsaa/searchCompliance.aspx>The State Projects Compliance Supplement is provided at: <https://apps.fldfs.com/fsaa/compliance.aspx>

EXHIBIT O**TERMS AND CONDITIONS OF CONSTRUCTION IN DEPARTMENT RIGHT OF WAY****Section 10.e. of the Agreement is amended as follows for Construction on the Department's Right of Way.**

1. If the Project involves construction on, under, or over the Department's right-of-way, the design work for all portions of the Project to be constructed on, under, or over the Department's right-of-way shall be submitted to the Department for review prior to any work being commenced, and the following provisions shall apply:

- a.** The Project shall be designed and constructed in accordance with the latest edition of the Department's Standard Specifications for Road and Bridge Construction and Department Design Standards and Manual of Uniform Traffic Control Devices ("MUTCD"). The following guidelines shall apply as deemed appropriate by the Department: the Department Structures Design Manual, AASHTO Guide Specifications for the Design of Pedestrian Bridges, AASHTO LRFD Bridge Design Specifications, the Florida Department of Transportation Design Manual ("FDM") and the Department Traffic Engineering Manual.

Designs that do not meet Department standards may be rejected by the Department at its sole discretion. The Department may allocate Department-managed resources to facilitate compliance with applicable design standards. If changes to the Department approved plans are required, the Recipient shall notify the Department of the changes and receive approval from the Department prior to the changes being constructed. The Recipient shall maintain the area of the Project, at all times, and coordinate any work needs of the Department during construction of the Project.

- b.** The Recipient shall notify the Department a minimum of 48 hours before beginning construction within, under, or over Department right-of-way. The Recipient shall notify the Department should construction be suspended for more than 5 working days. The Department contact person for construction is D5-ConstructionSpecialProjects@dot.state.fl.us.
- c.** The Recipient shall be responsible for monitoring construction operations and the maintenance of traffic ("MOT") throughout the course of the Project in accordance with the latest edition of the Department Standard Specifications, section 102. The Recipient is responsible for the development of a MOT plan and making any changes to that plan as necessary. The MOT plan shall be in accordance with the latest version of the Department Design Standards, Index 600 series. Any MOT plan developed by the Recipient that deviates from the Department Design Standards must be signed and sealed by a professional engineer. MOT plans will require approval by the Department prior to implementation.
- d.** The Recipient shall be responsible for locating all existing utilities, both aerial and underground, and for ensuring that all utility locations be accurately documented on the construction plans. All utility conflicts shall be fully resolved directly with the applicable utility.
- e.** The Recipient will be responsible for obtaining all permits that may be required by other agencies or local governmental entities.
- f.** It is hereby agreed by the Parties that this Agreement creates a permissive use only and all improvements located on, under, or over the Department's right-of-way resulting from this Agreement shall become the property of the Department. Neither the granting of the permission to use the Department right-of-way nor the placing of facilities upon the Department property shall operate to create or vest any property right to or in the Recipient, except as may otherwise be provided in separate agreements. The Recipient shall not acquire any right, title, interest or estate in Department right-of-way, of any nature or kind whatsoever, by virtue of the execution, operation, effect, or performance of this Agreement including, but not limited to, the Recipient's use, occupancy or possession of Department right-of-way. The Parties agree that this Agreement does not, and shall not be construed to, grant credit for any future transportation concurrency requirements pursuant to Chapter 163, Florida Statutes.

- g. The Recipient shall not cause any liens or encumbrances to attach to any portion of the Department's property, including but not limited to, the Department's right-of-way.
- h. The Recipient shall perform all required testing associated with the design and construction of the Project. Testing results shall be entered into the department's Materials Testing and Certification database application and the department must provide the final Materials Certification for the Project. The Department shall have the right to perform its own independent testing during the course of the Project.
- i. The Recipient shall exercise the rights granted herein and shall otherwise perform this Agreement in a good and workmanlike manner, with reasonable care, in accordance with the terms and provisions of this Agreement and all applicable federal, state, local, administrative, regulatory, safety and environmental laws, codes, rules, regulations, policies, procedures, guidelines, standards and permits, as the same may be constituted and amended from time to time, including, but not limited to, those of the Department, applicable Water Management District, Florida Department of Environmental Protection, Environmental Protection Recipient, the Army Corps of Engineers, the United States Coast Guard and local governmental entities.
- j. If the Department determines a condition exists which threatens the public's safety, the Department may, at its discretion, cause construction operations to cease and immediately have any potential hazards removed from on, under, or over its right-of-way at the sole cost, expense, and effort of the Recipient. The Recipient shall bear all construction delay costs incurred by the Department.
- k. The Recipient shall be responsible to maintain and restore all features that might require relocation within the Department right-of-way.
- l. The Recipient will be solely responsible for clean up or restoration required to correct any environmental or health hazards that may result from construction operations.
- m. The acceptance procedure will include a final "walk-through" by Recipient and Department personnel. Upon completion of construction, the Recipient will be required to submit to the Department final as-built plans and an engineering certification that construction was completed in accordance to the plans. Submittal of the final as-built plans shall include one complete set of the signed and sealed plans on 11" X 17" plan sheets and an electronic copy prepared in Portable Document Format (PDF). Prior to the termination of this Agreement, the Recipient shall remove its presence, including, but not limited to, all of the Recipient's property, machinery, and equipment from Department right-of-way and shall restore those portions of Department right of way disturbed or otherwise altered by the Project to substantially the same condition that existed immediately prior to the commencement of the Project.
- n. If the Department determines that the Project is not completed in accordance with the provisions of this Agreement, the Department shall deliver written notification of such to the Recipient. The Recipient shall have thirty (30) days from the date of receipt of the Department's written notice, or such other time as the Recipient and the Department mutually agree to in writing, to complete the Project and provide the Department with written notice of the same (the "Notice of Completion"). If the Recipient fails to timely deliver the Notice of Completion, or if it is determined that the Project is not properly completed after receipt of the Notice of Completion, the Department, within its discretion may: 1) provide the Recipient with written authorization granting such additional time as the Department deems appropriate to correct the deficiency(ies); or 2) correct the deficiency(ies) at the Recipient's sole cost and expense, without Department liability to the Recipient for any resulting loss or damage to property, including, but not limited to, machinery and equipment. If the Department elects to correct the deficiency(ies), the Department shall provide the Recipient with an invoice for the costs incurred by the Department and the Recipient shall pay the invoice within thirty (30) days of the date of the invoice.
- o. The Recipient shall implement best management practices for erosion and pollution control to prevent violation of state water quality standards. The Recipient shall be responsible for the correction of any erosion, shoaling, or water quality problems that result from the construction of the Project.

- p. Portable Traffic Monitoring Site (PTMS) or a Telemetry Traffic Monitoring Site (TTMS) may exist within the vicinity of your proposed work. It is the responsibility of the Recipient to locate and avoid damage to these sites. If a PTMS or TTMS is encountered during construction, the Department must be contacted immediately.
- q. During construction, highest priority must be given to pedestrian safety. If permission is granted to temporarily close a sidewalk, it should be done with the express condition that an alternate route will be provided, and shall continuously maintain pedestrian features to meet Americans Disability Act (ADA) standards.
- r. Restricted hours of operation will be from TO BE DETERMINED PRIOR TO CONSTRUCTION, (DAYS OF THE WEEK FOR RESTRICTED OPERATION TO BE DETERMINED), unless otherwise approved by the Operations Engineer, or designee.
- s. Lane closures on the state road system must be coordinated with the Public Information Office at least two weeks prior to the closure. The contact information for the Department's Public Information Office is:

D5-PIO@dot.state.fl.us

Note: (Highlighted sections indicate need to confirm information with District Office or appropriate DOT person managing the Agreement)

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FPN: <u>439865-3-34-01</u>	Fund: <u>TLWR</u> Org Code: <u>55053010541</u>	FLAIR Category: <u>088849</u> FLAIR Obj: <u>751000</u>
FPN: _____	Fund: _____ Org Code: _____	FLAIR Category: _____ FLAIR Obj: _____
FPN: _____	Fund: _____ Org Code: _____	FLAIR Category: _____ FLAIR Obj: _____
County No: <u>79</u>	Contract No: _____	Vendor No: <u>F596-000-412-003</u>

THIS STATE-FUNDED GRANT AGREEMENT ("Agreement") is entered into on _____, (This date to be entered by DOT only)
by and between the State of Florida Department of Transportation, ("Department"), and the City of Port Orange, ("Recipient"). The

Department and the Recipient are sometimes referred to in this Agreement as a "Party" and collectively as the "Parties".

NOW, THEREFORE, in consideration of the mutual benefits to be derived from joint participation on the Project, the Parties agree to the following:

- 1. Authority:** The Department is authorized to enter into this Agreement pursuant to Sections 334.044, 334.044(7), and *(select the applicable statutory authority for the program(s) below)*:
 - ☐ Section 339.2817 Florida Statutes, County Incentive Grant Program (CIGP), (CSFA 55.008)
 - ☐ Section 339.2818 Florida Statutes, Small County Outreach Program (SCOP), (CSFA 55.009)
 - ☐ Section 339.2816 Florida Statutes, Small County Road Assistance Program (SCRAP), (CSFA 55.016)
 - ☐ Section 339.2819 Florida Statutes, Transportation Regional Incentive Program (TRIP), (CSFA 55.026)
 - ☒ Section 339.81 Florida Statutes , Florida Shared-Use Nonmotorized (SUN) Trail Network Program , (CSFA 55.038)

The Recipient by Resolution or other form of official authorization, a copy of which is attached as **Exhibit "D"**, **Recipient Resolution**, and made a part of this Agreement, has authorized its officers to execute this Agreement on its behalf.

- 2. Purpose of Agreement:** The purpose of this Agreement is to provide for the Department's participation in St. Johns River to Sea Loop Trail (Spruce Creek Road) from South of Selin Circle to Herbert Street, as further described in **Exhibit "A", Project Description and Responsibilities**, attached to and incorporated into this Agreement ("Project"); to provide Department financial assistance to the Recipient; state the terms and conditions upon which Department funds will be provided; and to set forth the manner in which the Project will be undertaken and completed.
- 3. Term of the Agreement, Commencement and Completion of the Project:** This Agreement shall commence upon full execution by both Parties and the Recipient shall complete the Project on or before October 31, 2022. If the Recipient does not complete the Project within this time period, this Agreement will expire on the last day of the scheduled completion as provided in this paragraph unless an extension of the time period is requested by the Recipient and granted in writing by the Department prior to the expiration of this Agreement. Expiration of this Agreement will be considered termination of the Project. The Recipient acknowledges that no funding for the Project will be provided by the State under this Agreement for work on the Project that is not timely completed and invoiced in accordance with the terms of this Agreement, or for work performed prior to full execution of the Agreement. Notwithstanding the expiration of the required completion date provided in this Agreement and the consequent potential unavailability of any unexpended portion of State funding to be provided under this Agreement, the

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Recipient shall remain obligated to complete all aspects of the Project identified in **Exhibit "A"** in accordance with the remaining terms of this Agreement, unless otherwise agreed by the Parties, in writing.

Execution of this Agreement by both Parties shall be deemed a Notice to Proceed to the Recipient for the design phase or other non-construction phases of the Project. If the Project involves a construction phase, the Recipient shall not begin the construction phase of the Project until the Department issues a written Notice to Proceed for the construction phase. Prior to commencing the construction work described in this Agreement, the Recipient shall request a Notice to Proceed from the Department.

- 4. Amendments, Extensions and Assignment:** This Agreement may be amended or extended upon mutual written agreement of the Parties. This Agreement shall not be assigned, transferred or otherwise encumbered by the Recipient under any circumstances without the prior written consent of the Department.
- 5. Termination or Suspension of Project:** The Department may, by written notice to the Recipient, suspend any or all of the Department's obligations under this Agreement for the Recipient's failure to comply with applicable laws or the terms of this Agreement until such time as the event or condition resulting in such suspension has ceased or been corrected. The Department may also terminate this Agreement in whole or in part at any time the interest of the Department requires such termination.
 - a. If the Department terminates the Agreement, the Department shall notify the Recipient of such termination in writing within thirty (30) days of the Department's determination to terminate the Agreement, with instructions as to the effective date of termination or to specify the stage of work at which the Agreement is to be terminated.
 - b. The Parties to this Agreement may also terminate this Agreement when its continuation would not produce beneficial results commensurate with the further expenditure of funds. In this event, the Parties shall agree upon the termination conditions through mutual written agreement.
 - c. If the Agreement is terminated before performance is completed, the Recipient shall be paid only for that work satisfactorily performed for which costs can be substantiated. Such payment, however, may not exceed an amount which is the same percentage of the contract price as the amount of work satisfactorily completed is a percentage of the total work called for by this Agreement. All work in progress on the Department right-of-way will become the property of the Department and will be turned over promptly by the Recipient.
 - d. Upon termination of this Agreement, the Recipient shall, within thirty (30) days, refund to the Department any funds determined by the Department to have been expended in violation of this Agreement.
- 6. Project Cost:**
 - a. The estimated cost of the Project is \$200,000.00 (Two Hundred Thousand Dollars and No/100). This amount is based upon the Schedule of Financial Assistance in **Exhibit "B", Schedule of Financial Assistance**, attached and incorporated in this Agreement. The Schedule of Financial Assistance may be modified by execution of an amendment of the Agreement by the Parties.
 - b. The Department agrees to participate in the Project cost up to the maximum amount of \$200,000.00 (Two Hundred Thousand Dollars and No/100) and, additionally the Department's participation in the Project shall not exceed N/A% of the total cost of the Project, and as more fully described in **Exhibit "B"**. The Department's participation may be increased or reduced upon a determination of the actual bid amounts of the Project by the execution of an amendment. The Recipient agrees to bear all expenses in excess of the amount of the Department's participation and any cost overruns or deficits incurred in connection with completion of the Project.
 - c. The Department's participation in eligible Project costs is subject to, but not limited to:
 - i. Legislative approval of the Department's appropriation request in the work program year that the Project is scheduled to be committed;

- ii. Approval of all plans, specifications, contracts or other obligating documents and all other terms of this Agreement; and
- iii. Department approval of the Project scope and budget at the time appropriation authority becomes available.

7. Compensation and Payment:

- a. The Department shall reimburse the Recipient for costs incurred to perform services described in the Project Description and Responsibilities in **Exhibit "A"**, and as set forth in the Schedule of Financial Assistance in **Exhibit "B"**.
- b. The Recipient shall provide quantifiable, measurable, and verifiable units of deliverables. Each deliverable must specify the required minimum level of service to be performed and the criteria for evaluating successful completion. The Project and the quantifiable, measurable, and verifiable units of deliverables are described more fully in **Exhibit "A"**, Project Description and Responsibilities. Any changes to the deliverables shall require an amendment executed by both parties.
- c. Invoices shall be submitted no more often than monthly and no less than quarterly by the Recipient in detail sufficient for a proper pre-audit and post-audit, based on the quantifiable, measurable and verifiable deliverables as established in **Exhibit "A"**. Deliverables and costs incurred must be received and approved by the Department prior to reimbursements. Requests for reimbursement by the Recipient shall include an invoice, progress report and supporting documentation for the period of services being billed that are acceptable to the Department. The Recipient shall use the format for the invoice and progress report that is approved by the Department.
- d. Supporting documentation must establish that the deliverables were received and accepted in writing by the Recipient and must also establish that the required minimum standards or level of service to be performed based on the criteria for evaluating successful completion as specified in **Exhibit "A"** has been met. All costs invoiced shall be supported by properly executed payrolls, time records, invoices, contracts or vouchers evidencing in proper detail the nature and propriety of charges as described in **Exhibit "F"**, **Contract Payment Requirements**.
- e. Travel expenses are not compensable under this Agreement.
- f. Payment shall be made only after receipt and approval of deliverables and costs incurred unless advance payments are authorized by the Chief Financial Officer of the State of Florida under Chapters 215 and 216, Florida Statutes or the Department's Comptroller under Section 334.044(29), Florida Statutes.

If the Department determines that the performance of the Recipient is unsatisfactory, the Department shall notify the Recipient of the deficiency to be corrected, which correction shall be made within a time-frame to be specified by the Department. The Recipient shall, within thirty (30) days after notice from the Department, provide the Department with a corrective action plan describing how the Recipient will address all issues of contract non-performance, unacceptable performance, failure to meet the minimum performance levels, deliverable deficiencies, or contract non-compliance. If the corrective action plan is unacceptable to the Department, the Recipient will not be reimbursed to the extent of the non-performance. The Recipient will not be reimbursed until the Recipient resolves the deficiency. If the deficiency is subsequently resolved, the Recipient may bill the Department for the unpaid reimbursement request(s) during the next billing period. If the Recipient is unable to resolve the deficiency, the funds shall be forfeited at the end of the Agreement's term.

Recipients receiving financial assistance from the Department should be aware of the following time frames. Inspection and approval of deliverables and costs incurred shall take no longer than 20 days from the Department's receipt of the invoice. The Department has 20 days to deliver a request for payment (voucher) to the Department of Financial Services. The 20 days are measured from the latter of the date the invoice is received or the deliverables and costs incurred are received, inspected, and approved.

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If a payment is not available within 40 days, a separate interest penalty at a rate as established pursuant to Section 55.03(1), Florida Statutes, will be due and payable, in addition to the invoice amount, to the Recipient. Interest penalties of less than one (1) dollar will not be enforced unless the Recipient requests payment. Invoices that have to be returned to a Recipient because of Recipient preparation errors will result in a delay in the payment. The invoice payment requirements do not start until a properly completed invoice is provided to the Department.

A Vendor Ombudsman has been established within the Department of Financial Services. The duties of this individual include acting as an advocate for Recipient who may be experiencing problems in obtaining timely payment(s) from a state agency. The Vendor Ombudsman may be contacted at (850) 413-5516.

- g.** The Recipient shall maintain an accounting system or separate accounts to ensure funds and projects are tracked separately. Records of costs incurred under the terms of this Agreement shall be maintained and made available upon request to the Department at all times during the period of this Agreement and for five years after final payment is made. Copies of these documents and records shall be furnished to the Department upon request. Records of costs incurred include the Recipient's general accounting records and the project records, together with supporting documents and records, of the contractor and all subcontractors performing work on the project, and all other records of the contractor and subcontractors considered necessary by the Department for a proper audit of costs.
- h. Progress Reports.** Upon request, the Recipient agrees to provide progress reports to the Department in the standard format used by the Department and at intervals established by the Department. The Department will be entitled at all times to be advised, at its request, as to the status of the Project and of details thereof.
- i.** If, after Project completion, any claim is made by the Department resulting from an audit or for work or services performed pursuant to this Agreement, the Department may offset such amount from payments due for work or services done under any agreement which it has with the Recipient owing such amount if, upon demand, payment of the amount is not made within 60 days to the Department. Offsetting any amount pursuant to this paragraph shall not be considered a breach of contract by the Department.
- j.** The Recipient must submit the final invoice on the Project to the Department within 120 days after the completion of the Project. Invoices submitted after the 120-day time period may not be paid.
- k.** The Department's performance and obligation to pay under this Agreement is contingent upon an annual appropriation by the Legislature. If the Department's financial assistance for this Project is in multiple fiscal years, a notice of availability of funds from the Department's project manager must be received prior to costs being incurred by the Recipient. See **Exhibit "B"** for funding levels by fiscal year. Project costs utilizing any fiscal year funds are not eligible for reimbursement if incurred prior to funds approval being received. The Department will notify the Recipient, in writing, when funds are available.
- l.** In the event this Agreement is in excess of \$25,000 and has a term for a period of more than one year, the provisions of Section 339.135(6)(a), Florida Statutes, are hereby incorporated:

"The Department, during any fiscal year, shall not expend money, incur any liability, or enter into any contract which, by its terms, involves the expenditure of money in excess of the amounts budgeted as available for expenditure during such fiscal year. Any contract, verbal or written, made in violation of this subsection is null and void, and no money may be paid on such contract. The Department shall require a statement from the comptroller of the Department that funds are available prior to entering into any such contract or other binding commitment of funds. Nothing herein contained shall prevent the making of contracts for periods exceeding 1 year, but any contract so made shall be executory only for the value of the services to be rendered or agreed to be paid for in succeeding fiscal years, and this paragraph shall be incorporated verbatim in all contracts of the Department which are for an amount in excess of \$25,000 and which have a term for a period of more than 1 year."

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- m. Any Project funds made available by the Department pursuant to this Agreement which are determined by the Department to have been expended by the Recipient in violation of this Agreement or any other applicable law or regulation, shall be promptly refunded in full to the Department. Acceptance by the Department of any documentation or certifications, mandatory or otherwise permitted, that the Recipient files shall not constitute a waiver of the Department's rights as the funding agency to verify all information at a later date by audit or investigation.
- n. In determining the amount of the payment, the Department will exclude all Project costs incurred by the Recipient prior to the execution of this Agreement, costs incurred prior to issuance of a Notice to Proceed, costs incurred after the expiration of the Agreement, costs which are not provided for in the latest approved Schedule of Financial Assistance in **Exhibit "B"** for the Project, costs agreed to be borne by the Recipient or its contractors and subcontractors for not meeting the Project commencement and final invoice time lines, and costs attributable to goods or services received under a contract or other arrangements which have not been approved in writing by the Department.

8. General Requirements:

The Recipient shall complete the Project with all practical dispatch in a sound, economical, and efficient manner, and in accordance with the provisions in this Agreement and all applicable laws.

- a. The Recipient must obtain written approval from the Department prior to performing itself (through the efforts of its own employees) any aspect of the Project that will be funded under this Agreement.
 - ☐ If this box is checked, then the Agency is permitted to utilize its own forces and the following provision applies: **Use of Agency Workforce**. In the event the Agency proceeds with any phase of the Project utilizing its own forces, the Agency will only be reimbursed for direct costs (this excludes general overhead).
- b. The Recipient shall provide to the Department certification and a copy of appropriate documentation substantiating that all required right-of-way necessary for the Project has been obtained. Certification is required prior to authorization for advertisement for or solicitation of bids for construction of the Project, including if no right-of-way is required.
- c. The Recipient shall comply and require its contractors and subcontractors to comply with all terms and conditions of this Agreement and all federal, state, and local laws and regulations applicable to this Project.
- d. The Recipient shall have the sole responsibility for resolving claims and requests for additional work for the Project by the Recipient's contractors and consultants. No funds will be provided for payment of claims or additional work on the Project under this Agreement without the prior written approval of the claim or request for additional work by Department.

9. Contracts of the Recipient

- a. The Department has the right to review and approve any and all third party contracts with respect to the Project before the Recipient executes any contract or obligates itself in any manner requiring the disbursement of Department funds under this Agreement, including consultant or construction contracts or amendments thereto. If the Department exercises this right and the Recipient fails to obtain such approval, the Department may deny payment to the Recipient. The Department may review the qualifications of any consultant or contractor and to approve or disapprove the employment of such consultant or contractor.
- b. It is understood and agreed by the parties hereto that participation by the Department in a project that involves the purchase of commodities or contractual services or the purchasing of capital equipment or the equipping of facilities, where purchases or costs exceed the Threshold Amount for CATEGORY TWO per Chapter 287.017 Florida Statutes, is contingent on the Recipient complying in full with the provisions of Chapter 287.057 Florida Statutes. The Recipient shall certify to the Department that the purchase of commodities or contractual services has been accomplished in compliance with Chapter 287.057 Florida Statutes. It shall be the sole responsibility of the Recipient to ensure that any obligations made in accordance with this Section comply with the current threshold limits. Contracts, purchase orders, task orders,

construction change orders, or any other agreement that would result in exceeding the current budget contained in **Exhibit "B"**, or that are not consistent with the Project description and scope of services contained in **Exhibit "A"** must be approved by the Department prior to Recipient execution. Failure to obtain such approval, and subsequent execution of an amendment to the Agreement if required, shall be sufficient cause for nonpayment by the Department.

- c. Participation by the Department in a project that involves a consultant contract for engineering, architecture or surveying services, is contingent on the Recipient's complying in full with provisions of Section 287.055, Florida Statutes, Consultants' Competitive Negotiation Act. In all cases, the Recipient shall certify to the Department that selection has been accomplished in compliance with the Consultants' Competitive Negotiation Act.
- d. If the Project is procured pursuant to Chapter 255 for construction services and at the time of the competitive solicitation for the Project 50 percent or more of the cost of the Project is to be paid from state-appropriated funds, then the Recipient must comply with the requirements of Section 255.0991, Florida Statutes.

10. Design and Construction Standards and Required Approvals: In the event the Project includes construction the following provisions are incorporated into this Agreement:

- a. The Recipient is responsible for obtaining all permits necessary for the Project.
- b. In the event the Project involves construction on the Department's right-of-way, the Recipient shall provide the Department with written notification of either its intent to:
 - i. Award the construction of the Project to a Department prequalified contractor which is the lowest and best bidder in accordance with applicable state and federal statutes, rules, and regulations. The Recipient shall then submit a copy of the bid tally sheet(s) and awarded bid contract, or
 - ii. Construct the Project utilizing existing Recipient employees, if the Recipient can complete said Project within the time frame set forth in this Agreement. The Recipient's use of this option is subject to approval by the Department.
- c. The Recipient shall hire a qualified contractor using the Recipient's normal bid procedures to perform the construction work for the Project. For projects that are not located on the Department's right-of-way, the Recipient is not required to hire a contractor prequalified by the Department unless the Department notifies the Recipient prior to letting that they are required to hire a contractor prequalified by the Department.
- d. The Recipient is responsible for provision of Construction Engineering Inspection (CEI) services. The Department reserves the right to require the Recipient to hire a Department pre-qualified consultant firm that includes one individual that has completed the Advanced Maintenance of Traffic Level Training. Notwithstanding any provision of law to the contrary, design services and CEI services may not be performed by the same entity. Administration of the CEI staff shall be under the responsible charge of a State of Florida Licensed Professional Engineer who shall provide the certification that all design and construction for the Project meets the minimum construction standards established by Department. The Department shall have the right to approve the CEI firm. The Department shall have the right, but not the obligation, to perform independent assurance testing during the course of construction of the Project. Subject to the approval of the Department, the Recipient may choose to satisfy the requirements set forth in this paragraph by either hiring a Department prequalified consultant firm or utilizing Recipient staff that meet the requirements of this paragraph, or a combination thereof.
- e. The Recipient is responsible for the preparation of all design plans for the Project. The Department reserves the right to require the Recipient to hire a Department pre-qualified consultant for the design phase of the Project using the Recipient's normal procurement procedures to perform the design services for the Project. Notwithstanding any provision of law to the contrary, design services and CEI services may not be performed by the same entity. All design work on the Project shall be performed in accordance with the requirements of all applicable laws and governmental rules and regulations and federal and state accepted design standards for the type of construction contemplated by the Project, including, as applicable, but not

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limited to, the applicable provisions of the Manual of Uniform Traffic Control Devices (MUTCD) and the AASHTO Policy on Geometric Design of Streets and Highways. If any portion of the Project will be located on, under, or over any Department-owned right-of-way, the Department shall review the Project's design plans for compliance with all applicable standards of the Department, as provided in **Exhibit "O", Terms and Conditions of Construction**, which is attached to and incorporated into this Agreement.

- f. The Recipient shall adhere to the Department's Conflict of Interest Procedure (FDOT Topic No. 375-030-006).
- g. The Recipient will provide copies of the final design plans and specifications and final bid documents to the Department's Construction Project Manager prior to commencing construction of the Project. The Department will specify the number of copies required and the required format.
- h. The Recipient shall require the Recipient's contractor to post a payment and performance bond in accordance with applicable law.
- i. The Recipient shall be responsible to ensure that the construction work under this Agreement is performed in accordance with the approved construction documents, and that it will meet all applicable Recipient and Department standards.
- j. Upon completion of the work authorized by this Agreement, the Recipient shall notify the Department in writing of the completion of construction of the Project; and for all design work that originally required certification by a Professional Engineer, this notification shall contain an Engineers Certification of Compliance, signed and sealed by a Professional Engineer, the form of which is attached hereto and incorporated herein as **Exhibit "C", Engineers Certification of Completion**. The certification shall state that work has been completed in compliance with the Project construction plans and specifications. If any deviations are found from the approved plans, the certification shall include a list of all deviations along with an explanation that justifies the reason to accept each deviation.
- k. The Recipient shall provide the Department with as-built plans of any portions of the Project funded through the Agreement prior to final inspection.

11. Maintenance Obligations: In the event the Project includes construction then the following provisions are incorporated into this Agreement:

- a. The Recipient agrees to maintain any portion of the Project not located on the State Highway System constructed under this Agreement for its useful life. If the Recipient constructs any improvement on Department right-of-way, the Recipient

☒ shall

☐ shall not

maintain the improvements located on the Department right-of-way made for their useful life. If the Recipient is required to maintain Project improvements located on the Department right-of-way beyond final acceptance, then Recipient shall, prior to any disbursement of the State funding provided under this Agreement, also execute a Maintenance Memorandum of Agreement in a form that is acceptable to the Department. The Recipient has agreed to the foregoing by resolution, and such resolution is attached and incorporated into this Agreement as **Exhibit "D"**. This provision will survive termination of this Agreement.

12. State Single Audit: The administration of resources awarded through the Department to the Recipient by this Agreement may be subject to audits and/or monitoring by the Department. The following requirements do not limit the authority of the Department to conduct or arrange for the conduct of additional audits or evaluations of state financial assistance or limit the authority of any state agency inspector general, the Auditor General, or any other state official. The Recipient shall comply with all audit and audit reporting requirements as specified below.

- a. In addition to reviews of audits conducted in accordance with Section 215.97, Florida Statutes, monitoring procedures to monitor the Recipient's use of state financial assistance may include but not be limited to on-site visits by Department staff and/or other procedures including, reviewing any required performance and

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financial reports, following up, ensuring corrective action, and issuing management decisions on weaknesses found through audits when those findings pertain to state financial assistance awarded through the Department by this Agreement. By entering into this Agreement, the Recipient agrees to comply and cooperate fully with any monitoring procedures/processes deemed appropriate by the Department. The Recipient further agrees to comply and cooperate with any inspections, reviews, investigations, or audits deemed necessary by the Department, the Department of Financial Services (DFS) or the Auditor General.

- b. The Recipient, a nonstate entity as defined by Section 215.97(2)(n), Florida Statutes, as a recipient of state financial assistance awarded by the Department through this Agreement is subject to the following requirements:
- i. In the event the Recipient meets the audit threshold requirements established by Section 215.97, Florida Statutes, the Recipient must have a State single or project-specific audit conducted for such fiscal year in accordance with Section 215.97, Florida Statutes; applicable rules of the Department of Financial Services; and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General. **Exhibit "J", State Financial Assistance (Florida Single Audit Act)** to this Agreement indicates state financial assistance awarded through the Department by this Agreement needed by the Recipient to further comply with the requirements of Section 215.97, Florida Statutes. In determining the state financial assistance expended in a fiscal year, the Recipient shall consider all sources of state financial assistance, including state financial assistance received from the Department by this Agreement, other state agencies and other nonstate entities. State financial assistance does not include Federal direct or pass-through awards and resources received by a nonstate entity for Federal program matching requirements.
 - ii. In connection with the audit requirements, the Recipient shall ensure that the audit complies with the requirements of Section 215.97(8), Florida Statutes. This includes submission of a financial reporting package as defined by Section 215.97(2)(e), Florida Statutes, and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General.
 - iii. In the event the Recipient does not meet the audit threshold requirements established by Section 215.97, Florida Statutes, the Recipient is exempt for such fiscal year from the state single audit requirements of Section 215.97, Florida Statutes. However, the Recipient must provide a single audit exemption statement to the Department at FDOTSingleAudit@dot.state.fl.us no later than nine months after the end of the Recipient's audit period for each applicable audit year. In the event the Recipient does not meet the audit threshold requirements established by Section 215.97, Florida Statutes, in a fiscal year and elects to have an audit conducted in accordance with the provisions of Section 215.97, Florida Statutes, the cost of the audit must be paid from the Recipient's resources (i.e., the cost of such an audit must be paid from the Recipient's resources obtained from other than State entities).
 - iv. In accordance with Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, copies of financial reporting packages required by this Agreement shall be submitted to:

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Florida Department of Transportation
Office of Comptroller, MS 24
605 Suwannee Street
Tallahassee, FL 32399-0405
Email: FDOTSingleAudit@dot.state.fl.us

And

State of Florida Auditor General
Local Government Audits/342
111 West Madison Street, Room 401
Tallahassee, FL 32399-1450
Email: flaudgen_localgovt@aud.state.fl.us

- v. Any copies of financial reporting packages, reports or other information required to be submitted to the Department shall be submitted timely in accordance with Section 215.97, Florida Statutes, and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, as applicable.
 - vi. The Recipient, when submitting financial reporting packages to the Department for audits done in accordance with Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, should indicate the date the reporting package was delivered to the Recipient in correspondence accompanying the reporting package.
 - vii. Upon receipt, and within six months, the Department will review the Recipient's financial reporting package, including corrective action plans and management letters, to the extent necessary to determine whether timely and appropriate corrective action on all deficiencies has been taken pertaining to the state financial assistance provided through the Department by this Agreement. If the Recipient fails to have an audit conducted consistent with Section 215.97, Florida Statutes, the Department may take appropriate corrective action to enforce compliance.
 - viii. As a condition of receiving state financial assistance, the Recipient shall permit the Department, or its designee, DFS or the Auditor General access to the Recipient's records including financial statements, the independent auditor's working papers and project records as necessary. Records related to unresolved audit findings, appeals or litigation shall be retained until the action is complete or the dispute is resolved.
- c. The Recipient shall retain sufficient records demonstrating its compliance with the terms of this Agreement for a period of five years from the date the audit report is issued and shall allow the Department, or its designee, DFS or the Auditor General access to such records upon request. The Recipient shall ensure that the audit working papers are made available to the Department, or its designee, DFS or the Auditor General upon request for a period of five years from the date the audit report is issued unless extended in writing by the Department.

13. Restrictions, Prohibitions, Controls and Labor Provisions:

- a. A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity; may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.
- b. In accordance with Section 287.134, Florida Statutes, an entity or affiliate who has been placed on the Discriminatory Vendor List, kept by the Florida Department of Management Services, may not submit a bid on a contract to provide goods or services to a public entity; may not submit a bid on a contract with a public

entity for the construction or repair of a public building or public work; may not submit bids on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor or consultant under a contract with any public entity; and may not transact business with any public entity.

- c. An entity or affiliate who has had its Certificate of Qualification suspended, revoked, denied or have further been determined by the Department to be a non-responsible contractor may not submit a bid or perform work for the construction or repair of a public building or public work on a contract with the Recipient.
- d. No funds received pursuant to this Agreement may be expended for lobbying the Florida Legislature, judicial branch, or any state agency, in accordance with Section 216.347, Florida Statutes.
- e. The Department shall consider the employment by any contractor of unauthorized aliens a violation of Section 274A(e) of the Immigration and Nationality Act. If the contractor knowingly employs unauthorized aliens, such violation will be cause for unilateral cancellation of this Agreement.
- f. The Recipient shall:
 - i. Utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Recipient during the term of the contract; and
 - ii. Expressly require any subcontractors performing work or providing services pursuant to the state contract to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the contract term.
- g. The Recipient shall comply and require its contractors and subcontractors to comply with all terms and conditions of this Agreement and all federal, state, and local laws and regulations applicable to this Project.

14. Indemnification and Insurance:

- a. It is specifically agreed between the parties executing this Agreement that it is not intended by any of the provisions of any part of this Agreement to create in the public or any member thereof, a third-party beneficiary under this Agreement, or to authorize anyone not a party to this Agreement to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this Agreement. The Recipient guarantees the payment of all just claims for materials, supplies, tools, or labor and other just claims against the Recipient or any subcontractor, in connection with this Agreement.
- b. To the extent provided by law, Recipient shall indemnify, defend, and hold harmless the Department against any actions, claims, or damages arising out of, relating to, or resulting from negligent or wrongful act(s) of Recipient, or any of its officers, agents, or employees, acting within the scope of their office or employment, in connection with the rights granted to or exercised by Recipient hereunder, to the extent and within the limitations of Section 768.28, Florida Statutes. The foregoing indemnification shall not constitute a waiver of sovereign immunity beyond the limits set forth in Florida Statutes, Section 768.28, nor shall the same be construed to constitute agreement by Recipient to indemnify the Department for the negligent acts or omissions of the Department, its officers, agents, or employees, or for the acts of third parties. Nothing herein shall be construed as consent by Recipient to be sued by third parties in any manner arising out of this Agreement. This indemnification shall survive the termination of this Agreement.
- c. Recipient agrees to include the following indemnification in all contracts with contractors, subcontractors, consultants, or subconsultants (each referred to as "Entity" for the purposes of the below indemnification) who perform work in connection with this Agreement:

"To the extent provided by law, [ENTITY] shall indemnify, defend, and hold harmless the [RECIPIENT] and the State of Florida, Department of Transportation, including the Department's officers, agents, and employees, against any actions, claims, or damages arising out of, relating to, or resulting from negligent or wrongful act(s) of [ENTITY], or any of its officers, agents, or employees, acting within the scope of their office or employment, in connection with the rights

granted to or exercised by [ENTITY] hereunder, to the extent and within the limitations of Section 768.28, Florida Statutes.

The foregoing indemnification shall not constitute a waiver of sovereign immunity beyond the limits set forth in Florida Statutes, Section 768.28. Nor shall the same be construed to constitute agreement by [ENTITY] to indemnify [RECIPIENT] for the negligent acts or omissions of [RECIPIENT], its officers, agents, or employees, or third parties. Nor shall the same be construed to constitute agreement by [ENTITY] to indemnify the Department for the negligent acts or omissions of the Department, its officers, agents, or employees, or third parties. This indemnification shall survive the termination of this Agreement.”

- d. The Recipient shall provide Workers’ Compensation Insurance in accordance with Florida’s Workers’ Compensation law for all employees. If subletting any of the work, ensure that the subcontractor(s) and subconsultants have Workers’ Compensation Insurance for their employees in accordance with Florida’s Workers’ Compensation law. If using “leased employees” or employees obtained through professional employer organizations (“PEO’s”), ensure that such employees are covered by Workers’ Compensation insurance through the PEO’s or other leasing entities. Ensure that any equipment rental agreements that include operators or other personnel who are employees of independent contractors, sole proprietorships or partners are covered by insurance required under Florida’s Workers’ Compensation law.
- e. If the Recipient elects to self-perform the Project, and such self-performance is approved by the Department in accordance with the terms of this Agreement, the Recipient may self-insure and proof of self-insurance shall be provided to the Department. If the Recipient elects to hire a contractor or consultant to perform the Project, then the Recipient shall, or cause its contractor or consultant to carry Commercial General Liability insurance providing continuous coverage for all work or operations performed under the Agreement. Such insurance shall be no more restrictive than that provided by the latest occurrence form edition of the standard Commercial General Liability Coverage Form (ISO Form CG 00 01) as filed for use in the State of Florida. Recipient shall, or cause its contractor to cause the Department to be made an Additional Insured as to such insurance. Such coverage shall be on an “occurrence” basis and shall include Products/Completed Operations coverage. The coverage afforded to the Department as an Additional Insured shall be primary as to any other available insurance and shall not be more restrictive than the coverage afforded to the Named Insured. The limits of coverage shall not be less than \$1,000,000 for each occurrence and not less than a \$5,000,000 annual general aggregate, inclusive of amounts provided by an umbrella or excess policy. The limits of coverage described herein shall apply fully to the work or operations performed under the Agreement, and may not be shared with or diminished by claims unrelated to the Agreement. The policy/ies and coverage described herein may be subject to a deductible and such deductibles shall be paid by the Named Insured. No policy/ies or coverage described herein may contain or be subject to a Retention or a Self-Insured Retention unless the Recipient is a state agency or subdivision of the State of Florida that elects to self-perform the Project. Prior to the execution of the Agreement, and at all renewal periods which occur prior to final acceptance of the work, the Department shall be provided with an ACORD Certificate of Liability Insurance reflecting the coverage described herein. The Department shall be notified in writing within ten days of any cancellation, notice of cancellation, lapse, renewal, or proposed change to any policy or coverage described herein. The Department’s approval or failure to disapprove any policy/ies, coverage, or ACORD Certificates shall not relieve or excuse any obligation to procure and maintain the insurance required herein, nor serve as a waiver of any rights or defenses the Department may have.
- f. When the Agreement includes the construction of a railroad grade crossing, railroad overpass or underpass structure, or any other work or operations within the limits of the railroad right-of-way, including any encroachments thereon from work or operations in the vicinity of the railroad right-of-way, the Recipient shall, or cause its contractor to, in addition to the insurance coverage required above, procure and maintain Railroad Protective Liability Coverage (ISO Form CG 00 35) where the railroad is the Named Insured and where the limits are not less than \$2,000,000 combined single limit for bodily injury and/or property damage per occurrence, and with an annual aggregate limit of not less than \$6,000,000. The railroad shall also be added along with the Department as an Additional Insured on the policy/ies procured pursuant to the paragraph above. Prior to the execution of the Agreement, and at all renewal periods which occur prior to final acceptance of the work, both the Department and the railroad shall be provided with an ACORD Certificate of Liability Insurance reflecting the coverage described herein. The insurance described herein

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shall be maintained through final acceptance of the work. Both the Department and the railroad shall be notified in writing within ten days of any cancellation, notice of cancellation, renewal, or proposed change to any policy or coverage described herein. The Department's approval or failure to disapprove any policy/ies, coverage, or ACORD Certificates shall not relieve or excuse any obligation to procure and maintain the insurance required herein, nor serve as a waiver of any rights the Department may have.

- g.** When the Agreement involves work on or in the vicinity of utility-owned property or facilities, the utility shall be added along with the Department as an Additional Insured on the Commercial General Liability policy/ies procured above.

15. Miscellaneous:

- a.** In no event shall any payment to the Recipient constitute or be construed as a waiver by the Department of any breach of covenant or any default which may then exist on the part of the Recipient and the making of such payment by the Department, while any such breach or default shall exist, shall in no way impair or prejudice any right or remedy available to the Department with respect to such breach or default.
- b.** If any provision of this Agreement is held invalid, the remainder of this Agreement shall not be affected. In such an instance, the remainder would then continue to conform to the terms and requirements of applicable law.
- c.** The Recipient and the Department agree that the Recipient, its employees, contractors, subcontractors, consultants, and subconsultants are not agents of the Department as a result of this Agreement.
- d.** By execution of the Agreement, the Recipient represents that it has not paid and, also agrees not to pay, any bonus or commission for the purpose of obtaining an approval of its application for the financing hereunder.
- e.** Nothing in the Agreement shall require the Recipient to observe or enforce compliance with any provision or perform any act or do any other thing in contravention of any applicable state law. If any of the provisions of the Agreement violate any applicable state law, the Recipient will at once notify the Department in writing in order that appropriate changes and modifications may be made by the Department and the Recipient to the end that the Recipient may proceed as soon as possible with the Project.
- f.** This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which shall constitute the same Agreement. A facsimile or electronic transmission of this Agreement with a signature on behalf of a party will be legal and binding on such party.
- g.** The Department reserves the right to unilaterally terminate this Agreement for failure by the Recipient to comply with the provisions of Chapter 119, Florida Statutes.
- h.** The Recipient agrees to comply with Section 20.055(5), Florida Statutes, and to incorporate in all subcontracts the obligation to comply with Section 20.055(5), Florida Statutes
- i.** This Agreement shall be governed by and construed in accordance with the laws of the State of Florida. In the event of a conflict between any portion of the contract and Florida law, the laws of Florida shall prevail. The Recipient agrees to waive forum and venue and that the Department shall determine the forum and venue in which any dispute under this Agreement is decided.
- j.** This Agreement does not involve the purchase of Tangible Personal Property, as defined in Chapter 273, Florida Statutes.

16. Exhibits.

- a.** **Exhibits A, B, D, F, and J** are attached to and incorporated into this Agreement.
- b.** ☐ The Project will involve construction, therefore, **Exhibit "C"**, Engineer's Certification of Compliance is attached and incorporated into this Agreement.

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- c. ☐ Alternative Advance Payment Financial Provisions are used on this Project. If an Alternative Pay Method is used on this Project, then **Exhibit "H"**, Alternative Advance Payment Financial Provisions, is attached and incorporated into this Agreement.
- d. ☐ This Project utilizes Advance Project Reimbursement. If this Project utilizes Advance Project Reimbursement, then **Exhibit "K"**, Advance Project Reimbursement is attached and incorporated into this Agreement.
- e. ☒ A portion or all of the Project will utilize the Department's right-of-way and, therefore, **Exhibit O, Terms and Conditions of Construction in Department Right-of-Way**, is attached and incorporated into this Agreement.
- f. ☐ The following Exhibit(s), in addition to those listed in 16.a. through 16.f., are attached and incorporated into this Agreement: _____

g. Exhibit and Attachment List

Exhibit A: Project Description and Responsibilities

Exhibit B: Schedule of Financial Assistance

*Exhibit C: Engineer's Certification of Compliance

Exhibit D: Recipient Resolution

Exhibit F: Contract Payment Requirements

*Exhibit H: Alternative Advance Payment Financial Provisions

Exhibit J: State Financial Assistance (Florida Single Audit Act)

*Exhibit K: Advance Project Reimbursement

*Exhibit O: Terms and Conditions of Construction in Department Right-of-Way

*Additional Exhibit(s): _____

*Indicates that the Exhibit is only attached and incorporated if applicable box is selected.

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IN WITNESS WHEREOF, the Parties have executed this Agreement on the day and year written above.

RECIPIENT CITY OF PORT ORANGE

STATE OF FLORIDA,
DEPARTMENT OF TRANSPORTATION

By: _____
Name: DONALD O. BURNETTE
Title: MAYOR

By: _____
Name: Loreen C. Bobo, P.E.
Title: Director of Transportation Development

ATTEST: _____
Name: ROBIN L. FENWICK, MMC
Title: CITY CLERK

Legal Review:

By: _____
Name: _____

EXHIBIT A**PROJECT DESCRIPTION AND RESPONSIBILITIES**FPN: 439865-3-34-01

This exhibit forms an integral part of the Local Agency Program Agreement between the State of Florida, Department of Transportation and

the City of Port Orange (the Recipient)

PROJECT LOCATION:

☐ The project is on the National Highway System.

☒ The project is on the State Highway System.

PROJECT LENGTH AND MILE POST LIMITS: See Project Description Below

PROJECT DESCRIPTION:

This SunTrail project is located within the City of Port Orange and is part of the St. Johns River to Sea Loop Trail system. This segment, of the much larger trail system, begins south of the intersection of Spruce Creek Road and Selin Circle. The trail will extend northerly along the east side of Spruce Creek Road towards Oak Street. In the event acquisition of right-of-way or easement is unsuccessful, then the trail will extend northerly along the west side of Spruce Creek Road towards Oak Street and cross over Spruce Creek Road and continue along the east side of Halifax Canal from Oak Street to Dunlawton Avenue utilizing the existing 8' wide trail. The proposed trail will then continue along Spruce Creek Road from Dunlawton Avenue to Canal View Boulevard. The proposed trail continues through a vacant parcel to Herbert Street, connecting to the existing trail segment. Total project length is approximately 0.652 miles. Within the vacant parcel, owned by the City of Port Orange, an eight-foot wide, 300-foot long boardwalk is proposed in the wetland area. The entire length of the proposed sidewalk is located within the special flood hazard area and floodplain impacts and compensatory storage calculations and design will be required.

Project scope includes design of trail and lighting improvements along the trail route to enhance safety, particularly at points of conflict such as at driveways and roadway crossings. Design services shall include topographic/boundary survey, geotechnical investigations, environmental assessment(s), and engineering design. Utility coordination will be required. Coordination for permitting needs are anticipated. Right of way acquisition or any easement/easement modifications may be required and will be determined during the design phase. All pedestrian accommodations shall adhere to current ADA standards. Design of this trail shall follow the PD&E study finalized in April 2020. In addition, the SunTrail width will need to follow the latest FDOT Design Manual criteria, per Section 224.4, Widths. If a variance for the SunTrail width is needed, it will be coordinated with the Department.

SPECIAL CONSIDERATIONS BY RECIPIENT:

The Recipient is required to provide a copy of the design plans for the Department's review and approval to coordinate permitting with the Department, and notify the Department prior to commencement of any right-of-way activities.

If and when real property rights are to be acquired for a transportation facility, a scaled drawing must be prepared to clearly show the right-of-way to be acquired. It must show sufficient technical data, including land ties, to permit the preparation of legal descriptions for use in acquisition documents, and serve as an aid in appraisal and acquisition. It is supported by a Control Survey Map (certified survey) and does not purport to be a survey. This map provides the certified survey support

for the preparation of right of way related maps and is a depiction of the right of way survey field work performed for a specific transportation project.

Invoices, progress reports and other supporting documentation shall be submitted no more than monthly and no less than quarterly to D5-LocalPrograms@dot.state.fl.us

Pursuant to the enabling legislation, Section 339.81, F.S., components of the Sun Trail Network will not include:

Sidewalks; nature trails; loop trails wholly within a single park or natural area;

On-road facilities, such as bicycle lanes of routes other than on-road facilities that are no longer than one-half mile connecting two or more non-motorized trails, if the provision of non-road facilities is infeasible and if such on-road facilities are signed and marked for non-motorized use; an exception is made for on-road components of the Florida Keys Overseas Heritage Trail.

Allocation of Sun Trail funds will not include the development of amenities associated with trail projects. These amenities include but are not limited to:

- Benches, Trail Furniture or Seating Areas;
- Bicycle Racks, Air Stations or Lockers;
- Buildings, Restrooms, Wayside Structures or Overlooks, Shelters or Picnic Pavilions;
- Kiosks (Regulatory and Safety Signage Permitted);
- Landscaping (Trail Stabilization Permitted);
- Litter or Recycle Receptacles or Doggie Bag Dispensers;
- Parking Areas or Trailheads;
- Playgrounds, Fitness Equipment or Structures;
- Promotional or Educational Materials;
- Sculptures, Fountains, or Art; and
- Water Fountains, Spigots or Showers.

The Recipient shall commence the project's activities subsequent to the execution of this Agreement and shall perform in accordance with the following schedule:

- a) 30% Plans Submittal to be completed by October 18, 2021.
- b) 60% Plans Submittal to be completed by February 21, 2022.
- c) 90% Plans Submittal to be completed by April 25, 2022.
- d) Final Plans Submittal to be completed by June 21, 2022.

If this schedule cannot be met, the Recipient will notify the Department in writing with a revised schedule or the project is subject to the withdrawal of funding.

SPECIAL CONSIDERATIONS BY DEPARTMENT:

In the event the Project costs exceed the cost included in Exhibit "B", Schedule of Financial Assistance, the Recipient will be solely responsible to provide the additional funds that are necessary to complete the Project.

The project funding may be reduced to an amount equal to the award amount and/or the actual contract costs.

The remainder of this page intentionally left blank.

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EXHIBIT B
SCHEDULE OF FINANCIAL ASSISTANCE

RECIPIENT NAME & BILLING ADDRESS: City of Port Orange 1000 City Center Circle Port Orange, Florida 32129	FINANCIAL PROJECT NUMBER: <u>439865-3-34-01</u>
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I. PHASE OF WORK by Fiscal Year:	FY 2020/2021	FY	FY	TOTAL
Design- Phase 34	\$ 200,000.00	\$ 0.00	\$ 0.00	\$200,000.00
Maximum Department Participation - (TLWR)	N/A% or \$ 200,000.00	N/A% or \$ 0.00	N/A% or \$ 0.00	N/A% or \$ 200,000.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	N/A% or \$ 0.00	N/A% or \$ 0.00	N/A% or \$ 0.00	N/A% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00
Right of Way- Phase 44	\$ 0.00	\$ 0.00	\$ 0.00	\$0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	% or \$ 0.00	% or \$ 0.00	% or \$ 0.00	% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00
Construction/CEI - Phase 54	\$ 0.00	\$ 0.00	\$ 0.00	\$0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	% or \$ 0.00	% or \$ 0.00	% or \$ 0.00	% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00

Insert Phase and Number (if applicable)	\$ 0.00	\$ 0.00	\$ 0.00	\$0.00
Maximum Department Participation - (<u>Insert Program Name</u>)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (<u>Insert Program Name</u>)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (<u>Insert Program Name</u>)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	% or \$ 0.00	% or \$ 0.00	% or \$ 0.00	% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00
II. TOTAL PROJECT COST:	\$200,000.00	\$0.00	\$0.00	\$200,000.00

COST ANALYSIS CERTIFICATION AS REQUIRED BY SECTION 216.3475, FLORIDA STATUTES:

I certify that the cost for each line item budget category has been evaluated and determined to be allowable, reasonable, and necessary as required by Section 216.3475, F.S. Documentation is on file evidencing the methodology used and the conclusions reached.

Amir Asgarinik

District Grant Manager Name

Signature

Date

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STATE-FUNDED GRANT AGREEMENT

EXHIBIT D

RECIPIENT RESOLUTION

The Recipient's Resolution authorizing entry into this Agreement is attached and incorporated into this Agreement.

EXHIBIT "D"

RESOLUTION NO. 21-21

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA, APPROVING A STATE-FUNDED GRANT AGREEMENT FOR FPN 439865-3-34-01, FOR DESIGN OF THE ST. JOHNS RIVER TO SEA LOOP TRAIL (SPRUCE CREEK ROAD) FROM SOUTH OF SELIN CIRCLE TO HERBERT STREET; AUTHORIZING THE MAYOR AND CITY CLERK TO EXECUTE THE GRANT AGREEMENT WITH THE FLORIDA DEPARTMENT OF TRANSPORTATION; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the State of Florida Department of Transportation and the City of Port Orange desire to facilitate the St. Johns River to Sea Loop Trail (Spruce Creek Road) from South of Selin Circle to Herbert Street and,

WHEREAS, the State of Florida Department of Transportation has requested the City of Port Orange to execute and deliver to the State of Florida Department of Transportation the State-Funded Grant Agreement for the aforementioned project, FPN 439865-3-34-01.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA:

Section 1. The City Council of the City of Port Orange, Florida, hereby approves and authorizes the Mayor and City Clerk to make, execute, and deliver to the State of Florida Department of Transportation the State-Funded Grant Agreement for the aforementioned project, FPN 439865-3-34-01, a copy of which is attached hereto as **Exhibit "1"**.

EXHIBIT "D"

RESO. NO. 21-21

Section 2. This resolution shall become effective immediately upon adoption.

MAYOR DONALD O. BURNETTE

ATTEST:

Robin L. Fenwick, MMC, City Clerk

Adopted on the day of

Reviewed and Approved: _____
Shannon K. Balmer, Assistant City Attorney

FPN: <u>439865-3-34-01</u>	Fund: <u>TLWR</u> Org Code: <u>55053010541</u>	FLAIR Category: <u>088849</u> FLAIR Obj: <u>751000</u>
FPN: _____	Fund: _____ Org Code: _____	FLAIR Category: _____ FLAIR Obj: _____
FPN: _____	Fund: _____ Org Code: _____	FLAIR Category: _____ FLAIR Obj: _____
County No: <u>79</u>	Contract No: _____	Vendor No: <u>F596-000-412-003</u>

THIS STATE-FUNDED GRANT AGREEMENT ("Agreement") is entered into on _____, (This date to be entered by DOT only)

by and between the State of Florida Department of Transportation, ("Department"), and the City of Port Orange, ("Recipient"). The

Department and the Recipient are sometimes referred to in this Agreement as a "Party" and collectively as the "Parties".

NOW, THEREFORE, in consideration of the mutual benefits to be derived from joint participation on the Project, the Parties agree to the following:

1. **Authority:** The Department is authorized to enter into this Agreement pursuant to Sections 334.044, 334.044(7), and *(select the applicable statutory authority for the program(s) below)*:
 - ☐ Section 339.2817 Florida Statutes, County Incentive Grant Program (CIGP), (CSFA 55.008)
 - ☐ Section 339.2818 Florida Statutes, Small County Outreach Program (SCOP), (CSFA 55.009)
 - ☐ Section 339.2816 Florida Statutes, Small County Road Assistance Program (SCRAP), (CSFA 55.016)
 - ☐ Section 339.2819 Florida Statutes, Transportation Regional Incentive Program (TRIP), (CSFA 55.026)
 - ☒ Section 339.81 Florida Statutes , Florida Shared-Use Nonmotorized (SUN) Trail Network Program , (CSFA 55.038)

The Recipient by Resolution or other form of official authorization, a copy of which is attached as **Exhibit "D"**, **Recipient Resolution**, and made a part of this Agreement, has authorized its officers to execute this Agreement on its behalf.

2. **Purpose of Agreement:** The purpose of this Agreement is to provide for the Department's participation in St. Johns River to Sea Loop Trail (Spruce Creek Road) from South of Selin Circle to Herbert Street, as further described in **Exhibit "A", Project Description and Responsibilities**, attached to and incorporated into this Agreement ("Project"); to provide Department financial assistance to the Recipient; state the terms and conditions upon which Department funds will be provided; and to set forth the manner in which the Project will be undertaken and completed.
3. **Term of the Agreement, Commencement and Completion of the Project:** This Agreement shall commence upon full execution by both Parties and the Recipient shall complete the Project on or before October 31, 2022. If the Recipient does not complete the Project within this time period, this Agreement will expire on the last day of the scheduled completion as provided in this paragraph unless an extension of the time period is requested by the Recipient and granted in writing by the Department prior to the expiration of this Agreement. Expiration of this Agreement will be considered termination of the Project. The Recipient acknowledges that no funding for the Project will be provided by the State under this Agreement for work on the Project that is not timely completed and invoiced in accordance with the terms of this Agreement, or for work performed prior to full execution of the Agreement. Notwithstanding the expiration of the required completion date provided in this Agreement and the consequent potential unavailability of any unexpended portion of State funding to be provided under this Agreement, the

Recipient shall remain obligated to complete all aspects of the Project identified in **Exhibit "A"** in accordance with the remaining terms of this Agreement, unless otherwise agreed by the Parties, in writing.

Execution of this Agreement by both Parties shall be deemed a Notice to Proceed to the Recipient for the design phase or other non-construction phases of the Project. If the Project involves a construction phase, the Recipient shall not begin the construction phase of the Project until the Department issues a written Notice to Proceed for the construction phase. Prior to commencing the construction work described in this Agreement, the Recipient shall request a Notice to Proceed from the Department.

- 4. Amendments, Extensions and Assignment:** This Agreement may be amended or extended upon mutual written agreement of the Parties. This Agreement shall not be assigned, transferred or otherwise encumbered by the Recipient under any circumstances without the prior written consent of the Department.
- 5. Termination or Suspension of Project:** The Department may, by written notice to the Recipient, suspend any or all of the Department's obligations under this Agreement for the Recipient's failure to comply with applicable laws or the terms of this Agreement until such time as the event or condition resulting in such suspension has ceased or been corrected. The Department may also terminate this Agreement in whole or in part at any time the interest of the Department requires such termination.
 - a. If the Department terminates the Agreement, the Department shall notify the Recipient of such termination in writing within thirty (30) days of the Department's determination to terminate the Agreement, with instructions as to the effective date of termination or to specify the stage of work at which the Agreement is to be terminated.
 - b. The Parties to this Agreement may also terminate this Agreement when its continuation would not produce beneficial results commensurate with the further expenditure of funds. In this event, the Parties shall agree upon the termination conditions through mutual written agreement.
 - c. If the Agreement is terminated before performance is completed, the Recipient shall be paid only for that work satisfactorily performed for which costs can be substantiated. Such payment, however, may not exceed an amount which is the same percentage of the contract price as the amount of work satisfactorily completed is a percentage of the total work called for by this Agreement. All work in progress on the Department right-of-way will become the property of the Department and will be turned over promptly by the Recipient.
 - d. Upon termination of this Agreement, the Recipient shall, within thirty (30) days, refund to the Department any funds determined by the Department to have been expended in violation of this Agreement.
- 6. Project Cost:**
 - a. The estimated cost of the Project is \$200,000.00 (Two Hundred Thousand Dollars and No/100). This amount is based upon the Schedule of Financial Assistance in **Exhibit "B", Schedule of Financial Assistance**, attached and incorporated in this Agreement. The Schedule of Financial Assistance may be modified by execution of an amendment of the Agreement by the Parties.
 - b. The Department agrees to participate in the Project cost up to the maximum amount of \$200,000.00 (Two Hundred Thousand Dollars and No/100) and, additionally the Department's participation in the Project shall not exceed N/A% of the total cost of the Project, and as more fully described in **Exhibit "B"**. The Department's participation may be increased or reduced upon a determination of the actual bid amounts of the Project by the execution of an amendment. The Recipient agrees to bear all expenses in excess of the amount of the Department's participation and any cost overruns or deficits incurred in connection with completion of the Project.
 - c. The Department's participation in eligible Project costs is subject to, but not limited to:
 - i. Legislative approval of the Department's appropriation request in the work program year that the Project is scheduled to be committed;

- ii. Approval of all plans, specifications, contracts or other obligating documents and all other terms of this Agreement; and
- iii. Department approval of the Project scope and budget at the time appropriation authority becomes available.

7. Compensation and Payment:

- a. The Department shall reimburse the Recipient for costs incurred to perform services described in the Project Description and Responsibilities in **Exhibit "A"**, and as set forth in the Schedule of Financial Assistance in **Exhibit "B"**.
- b. The Recipient shall provide quantifiable, measurable, and verifiable units of deliverables. Each deliverable must specify the required minimum level of service to be performed and the criteria for evaluating successful completion. The Project and the quantifiable, measurable, and verifiable units of deliverables are described more fully in **Exhibit "A"**, Project Description and Responsibilities. Any changes to the deliverables shall require an amendment executed by both parties.
- c. Invoices shall be submitted no more often than monthly and no less than quarterly by the Recipient in detail sufficient for a proper pre-audit and post-audit, based on the quantifiable, measurable and verifiable deliverables as established in **Exhibit "A"**. Deliverables and costs incurred must be received and approved by the Department prior to reimbursements. Requests for reimbursement by the Recipient shall include an invoice, progress report and supporting documentation for the period of services being billed that are acceptable to the Department. The Recipient shall use the format for the invoice and progress report that is approved by the Department.
- d. Supporting documentation must establish that the deliverables were received and accepted in writing by the Recipient and must also establish that the required minimum standards or level of service to be performed based on the criteria for evaluating successful completion as specified in **Exhibit "A"** has been met. All costs invoiced shall be supported by properly executed payrolls, time records, invoices, contracts or vouchers evidencing in proper detail the nature and propriety of charges as described in **Exhibit "F"**, **Contract Payment Requirements**.
- e. Travel expenses are not compensable under this Agreement.
- f. Payment shall be made only after receipt and approval of deliverables and costs incurred unless advance payments are authorized by the Chief Financial Officer of the State of Florida under Chapters 215 and 216, Florida Statutes or the Department's Comptroller under Section 334.044(29), Florida Statutes.

If the Department determines that the performance of the Recipient is unsatisfactory, the Department shall notify the Recipient of the deficiency to be corrected, which correction shall be made within a time-frame to be specified by the Department. The Recipient shall, within thirty (30) days after notice from the Department, provide the Department with a corrective action plan describing how the Recipient will address all issues of contract non-performance, unacceptable performance, failure to meet the minimum performance levels, deliverable deficiencies, or contract non-compliance. If the corrective action plan is unacceptable to the Department, the Recipient will not be reimbursed to the extent of the non-performance. The Recipient will not be reimbursed until the Recipient resolves the deficiency. If the deficiency is subsequently resolved, the Recipient may bill the Department for the unpaid reimbursement request(s) during the next billing period. If the Recipient is unable to resolve the deficiency, the funds shall be forfeited at the end of the Agreement's term.

Recipients receiving financial assistance from the Department should be aware of the following time frames. Inspection and approval of deliverables and costs incurred shall take no longer than 20 days from the Department's receipt of the invoice. The Department has 20 days to deliver a request for payment (voucher) to the Department of Financial Services. The 20 days are measured from the latter of the date the invoice is received or the deliverables and costs incurred are received, inspected, and approved.

If a payment is not available within 40 days, a separate interest penalty at a rate as established pursuant to Section 55.03(1), Florida Statutes, will be due and payable, in addition to the invoice amount, to the Recipient. Interest penalties of less than one (1) dollar will not be enforced unless the Recipient requests payment. Invoices that have to be returned to a Recipient because of Recipient preparation errors will result in a delay in the payment. The invoice payment requirements do not start until a properly completed invoice is provided to the Department.

A Vendor Ombudsman has been established within the Department of Financial Services. The duties of this individual include acting as an advocate for Recipient who may be experiencing problems in obtaining timely payment(s) from a state agency. The Vendor Ombudsman may be contacted at (850) 413-5516.

- g. The Recipient shall maintain an accounting system or separate accounts to ensure funds and projects are tracked separately. Records of costs incurred under the terms of this Agreement shall be maintained and made available upon request to the Department at all times during the period of this Agreement and for five years after final payment is made. Copies of these documents and records shall be furnished to the Department upon request. Records of costs incurred include the Recipient's general accounting records and the project records, together with supporting documents and records, of the contractor and all subcontractors performing work on the project, and all other records of the contractor and subcontractors considered necessary by the Department for a proper audit of costs.
- h. **Progress Reports.** Upon request, the Recipient agrees to provide progress reports to the Department in the standard format used by the Department and at intervals established by the Department. The Department will be entitled at all times to be advised, at its request, as to the status of the Project and of details thereof.
- i. If, after Project completion, any claim is made by the Department resulting from an audit or for work or services performed pursuant to this Agreement, the Department may offset such amount from payments due for work or services done under any agreement which it has with the Recipient owing such amount if, upon demand, payment of the amount is not made within 60 days to the Department. Offsetting any amount pursuant to this paragraph shall not be considered a breach of contract by the Department.
- j. The Recipient must submit the final invoice on the Project to the Department within 120 days after the completion of the Project. Invoices submitted after the 120-day time period may not be paid.
- k. The Department's performance and obligation to pay under this Agreement is contingent upon an annual appropriation by the Legislature. If the Department's financial assistance for this Project is in multiple fiscal years, a notice of availability of funds from the Department's project manager must be received prior to costs being incurred by the Recipient. See **Exhibit "B"** for funding levels by fiscal year. Project costs utilizing any fiscal year funds are not eligible for reimbursement if incurred prior to funds approval being received. The Department will notify the Recipient, in writing, when funds are available.
- l. In the event this Agreement is in excess of \$25,000 and has a term for a period of more than one year, the provisions of Section 339.135(6)(a), Florida Statutes, are hereby incorporated:

"The Department, during any fiscal year, shall not expend money, incur any liability, or enter into any contract which, by its terms, involves the expenditure of money in excess of the amounts budgeted as available for expenditure during such fiscal year. Any contract, verbal or written, made in violation of this subsection is null and void, and no money may be paid on such contract. The Department shall require a statement from the comptroller of the Department that funds are available prior to entering into any such contract or other binding commitment of funds. Nothing herein contained shall prevent the making of contracts for periods exceeding 1 year, but any contract so made shall be executory only for the value of the services to be rendered or agreed to be paid for in succeeding fiscal years, and this paragraph shall be incorporated verbatim in all contracts of the Department which are for an amount in excess of \$25,000 and which have a term for a period of more than 1 year."

- m. Any Project funds made available by the Department pursuant to this Agreement which are determined by the Department to have been expended by the Recipient in violation of this Agreement or any other applicable law or regulation, shall be promptly refunded in full to the Department. Acceptance by the Department of any documentation or certifications, mandatory or otherwise permitted, that the Recipient files shall not constitute a waiver of the Department's rights as the funding agency to verify all information at a later date by audit or investigation.
- n. In determining the amount of the payment, the Department will exclude all Project costs incurred by the Recipient prior to the execution of this Agreement, costs incurred prior to issuance of a Notice to Proceed, costs incurred after the expiration of the Agreement, costs which are not provided for in the latest approved Schedule of Financial Assistance in **Exhibit "B"** for the Project, costs agreed to be borne by the Recipient or its contractors and subcontractors for not meeting the Project commencement and final invoice time lines, and costs attributable to goods or services received under a contract or other arrangements which have not been approved in writing by the Department.

8. General Requirements:

The Recipient shall complete the Project with all practical dispatch in a sound, economical, and efficient manner, and in accordance with the provisions in this Agreement and all applicable laws.

- a. The Recipient must obtain written approval from the Department prior to performing itself (through the efforts of its own employees) any aspect of the Project that will be funded under this Agreement.
 - ☐ If this box is checked, then the Agency is permitted to utilize its own forces and the following provision applies: **Use of Agency Workforce.** In the event the Agency proceeds with any phase of the Project utilizing its own forces, the Agency will only be reimbursed for direct costs (this excludes general overhead).
- b. The Recipient shall provide to the Department certification and a copy of appropriate documentation substantiating that all required right-of-way necessary for the Project has been obtained. Certification is required prior to authorization for advertisement for or solicitation of bids for construction of the Project, including if no right-of-way is required.
- c. The Recipient shall comply and require its contractors and subcontractors to comply with all terms and conditions of this Agreement and all federal, state, and local laws and regulations applicable to this Project.
- d. The Recipient shall have the sole responsibility for resolving claims and requests for additional work for the Project by the Recipient's contractors and consultants. No funds will be provided for payment of claims or additional work on the Project under this Agreement without the prior written approval of the claim or request for additional work by Department.

9. Contracts of the Recipient

- a. The Department has the right to review and approve any and all third party contracts with respect to the Project before the Recipient executes any contract or obligates itself in any manner requiring the disbursement of Department funds under this Agreement, including consultant or construction contracts or amendments thereto. If the Department exercises this right and the Recipient fails to obtain such approval, the Department may deny payment to the Recipient. The Department may review the qualifications of any consultant or contractor and to approve or disapprove the employment of such consultant or contractor.
- b. It is understood and agreed by the parties hereto that participation by the Department in a project that involves the purchase of commodities or contractual services or the purchasing of capital equipment or the equipping of facilities, where purchases or costs exceed the Threshold Amount for CATEGORY TWO per Chapter 287.017 Florida Statutes, is contingent on the Recipient complying in full with the provisions of Chapter 287.057 Florida Statutes. The Recipient shall certify to the Department that the purchase of commodities or contractual services has been accomplished in compliance with Chapter 287.057 Florida Statutes. It shall be the sole responsibility of the Recipient to ensure that any obligations made in accordance with this Section comply with the current threshold limits. Contracts, purchase orders, task orders,

construction change orders, or any other agreement that would result in exceeding the current budget contained in **Exhibit "B"**, or that are not consistent with the Project description and scope of services contained in **Exhibit "A"** must be approved by the Department prior to Recipient execution. Failure to obtain such approval, and subsequent execution of an amendment to the Agreement if required, shall be sufficient cause for nonpayment by the Department.

- c. Participation by the Department in a project that involves a consultant contract for engineering, architecture or surveying services, is contingent on the Recipient's complying in full with provisions of Section 287.055, Florida Statutes, Consultants' Competitive Negotiation Act. In all cases, the Recipient shall certify to the Department that selection has been accomplished in compliance with the Consultants' Competitive Negotiation Act.
- d. If the Project is procured pursuant to Chapter 255 for construction services and at the time of the competitive solicitation for the Project 50 percent or more of the cost of the Project is to be paid from state-appropriated funds, then the Recipient must comply with the requirements of Section 255.0991, Florida Statutes.

10. Design and Construction Standards and Required Approvals: In the event the Project includes construction the following provisions are incorporated into this Agreement:

- a. The Recipient is responsible for obtaining all permits necessary for the Project.
- b. In the event the Project involves construction on the Department's right-of-way, the Recipient shall provide the Department with written notification of either its intent to:
 - i. Award the construction of the Project to a Department prequalified contractor which is the lowest and best bidder in accordance with applicable state and federal statutes, rules, and regulations. The Recipient shall then submit a copy of the bid tally sheet(s) and awarded bid contract, or
 - ii. Construct the Project utilizing existing Recipient employees, if the Recipient can complete said Project within the time frame set forth in this Agreement. The Recipient's use of this option is subject to approval by the Department.
- c. The Recipient shall hire a qualified contractor using the Recipient's normal bid procedures to perform the construction work for the Project. For projects that are not located on the Department's right-of-way, the Recipient is not required to hire a contractor prequalified by the Department unless the Department notifies the Recipient prior to letting that they are required to hire a contractor prequalified by the Department.
- d. The Recipient is responsible for provision of Construction Engineering Inspection (CEI) services. The Department reserves the right to require the Recipient to hire a Department pre-qualified consultant firm that includes one individual that has completed the Advanced Maintenance of Traffic Level Training. Notwithstanding any provision of law to the contrary, design services and CEI services may not be performed by the same entity. Administration of the CEI staff shall be under the responsible charge of a State of Florida Licensed Professional Engineer who shall provide the certification that all design and construction for the Project meets the minimum construction standards established by Department. The Department shall have the right to approve the CEI firm. The Department shall have the right, but not the obligation, to perform independent assurance testing during the course of construction of the Project. Subject to the approval of the Department, the Recipient may choose to satisfy the requirements set forth in this paragraph by either hiring a Department prequalified consultant firm or utilizing Recipient staff that meet the requirements of this paragraph, or a combination thereof.
- e. The Recipient is responsible for the preparation of all design plans for the Project. The Department reserves the right to require the Recipient to hire a Department pre-qualified consultant for the design phase of the Project using the Recipient's normal procurement procedures to perform the design services for the Project. Notwithstanding any provision of law to the contrary, design services and CEI services may not be performed by the same entity. All design work on the Project shall be performed in accordance with the requirements of all applicable laws and governmental rules and regulations and federal and state accepted design standards for the type of construction contemplated by the Project, including, as applicable, but not

limited to, the applicable provisions of the Manual of Uniform Traffic Control Devices (MUTCD) and the AASHTO Policy on Geometric Design of Streets and Highways. If any portion of the Project will be located on, under, or over any Department-owned right-of-way, the Department shall review the Project's design plans for compliance with all applicable standards of the Department, as provided in **Exhibit "O", Terms and Conditions of Construction**, which is attached to and incorporated into this Agreement.

- f. The Recipient shall adhere to the Department's Conflict of Interest Procedure (FDOT Topic No. 375-030-006).
- g. The Recipient will provide copies of the final design plans and specifications and final bid documents to the Department's Construction Project Manager prior to commencing construction of the Project. The Department will specify the number of copies required and the required format.
- h. The Recipient shall require the Recipient's contractor to post a payment and performance bond in accordance with applicable law.
- i. The Recipient shall be responsible to ensure that the construction work under this Agreement is performed in accordance with the approved construction documents, and that it will meet all applicable Recipient and Department standards.
- j. Upon completion of the work authorized by this Agreement, the Recipient shall notify the Department in writing of the completion of construction of the Project; and for all design work that originally required certification by a Professional Engineer, this notification shall contain an Engineers Certification of Compliance, signed and sealed by a Professional Engineer, the form of which is attached hereto and incorporated herein as **Exhibit "C", Engineers Certification of Completion**. The certification shall state that work has been completed in compliance with the Project construction plans and specifications. If any deviations are found from the approved plans, the certification shall include a list of all deviations along with an explanation that justifies the reason to accept each deviation.
- k. The Recipient shall provide the Department with as-built plans of any portions of the Project funded through the Agreement prior to final inspection.

11. Maintenance Obligations: In the event the Project includes construction then the following provisions are incorporated into this Agreement:

- a. The Recipient agrees to maintain any portion of the Project not located on the State Highway System constructed under this Agreement for its useful life. If the Recipient constructs any improvement on Department right-of-way, the Recipient

☒ shall

☐ shall not

maintain the improvements located on the Department right-of-way made for their useful life. If the Recipient is required to maintain Project improvements located on the Department right-of-way beyond final acceptance, then Recipient shall, prior to any disbursement of the State funding provided under this Agreement, also execute a Maintenance Memorandum of Agreement in a form that is acceptable to the Department. The Recipient has agreed to the foregoing by resolution, and such resolution is attached and incorporated into this Agreement as **Exhibit "D"**. This provision will survive termination of this Agreement.

12. State Single Audit: The administration of resources awarded through the Department to the Recipient by this Agreement may be subject to audits and/or monitoring by the Department. The following requirements do not limit the authority of the Department to conduct or arrange for the conduct of additional audits or evaluations of state financial assistance or limit the authority of any state agency inspector general, the Auditor General, or any other state official. The Recipient shall comply with all audit and audit reporting requirements as specified below.

- a. In addition to reviews of audits conducted in accordance with Section 215.97, Florida Statutes, monitoring procedures to monitor the Recipient's use of state financial assistance may include but not be limited to on-site visits by Department staff and/or other procedures including, reviewing any required performance and

financial reports, following up, ensuring corrective action, and issuing management decisions on weaknesses found through audits when those findings pertain to state financial assistance awarded through the Department by this Agreement. By entering into this Agreement, the Recipient agrees to comply and cooperate fully with any monitoring procedures/processes deemed appropriate by the Department. The Recipient further agrees to comply and cooperate with any inspections, reviews, investigations, or audits deemed necessary by the Department, the Department of Financial Services (DFS) or the Auditor General.

- b. The Recipient, a nonstate entity as defined by Section 215.97(2)(n), Florida Statutes, as a recipient of state financial assistance awarded by the Department through this Agreement is subject to the following requirements:
 - i. In the event the Recipient meets the audit threshold requirements established by Section 215.97, Florida Statutes, the Recipient must have a State single or project-specific audit conducted for such fiscal year in accordance with Section 215.97, Florida Statutes; applicable rules of the Department of Financial Services; and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General. **Exhibit "J", State Financial Assistance (Florida Single Audit Act)** to this Agreement indicates state financial assistance awarded through the Department by this Agreement needed by the Recipient to further comply with the requirements of Section 215.97, Florida Statutes. In determining the state financial assistance expended in a fiscal year, the Recipient shall consider all sources of state financial assistance, including state financial assistance received from the Department by this Agreement, other state agencies and other nonstate entities. State financial assistance does not include Federal direct or pass-through awards and resources received by a nonstate entity for Federal program matching requirements.
 - ii. In connection with the audit requirements, the Recipient shall ensure that the audit complies with the requirements of Section 215.97(8), Florida Statutes. This includes submission of a financial reporting package as defined by Section 215.97(2)(e), Florida Statutes, and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General.
 - iii. In the event the Recipient does not meet the audit threshold requirements established by Section 215.97, Florida Statutes, the Recipient is exempt for such fiscal year from the state single audit requirements of Section 215.97, Florida Statutes. However, the Recipient must provide a single audit exemption statement to the Department at FDOTSingleAudit@dot.state.fl.us no later than nine months after the end of the Recipient's audit period for each applicable audit year. In the event the Recipient does not meet the audit threshold requirements established by Section 215.97, Florida Statutes, in a fiscal year and elects to have an audit conducted in accordance with the provisions of Section 215.97, Florida Statutes, the cost of the audit must be paid from the Recipient's resources (i.e., the cost of such an audit must be paid from the Recipient's resources obtained from other than State entities).
 - iv. In accordance with Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, copies of financial reporting packages required by this Agreement shall be submitted to:

Florida Department of Transportation
Office of Comptroller, MS 24
605 Suwannee Street
Tallahassee, FL 32399-0405
Email: FDOTSingleAudit@dot.state.fl.us

And

State of Florida Auditor General
Local Government Audits/342
111 West Madison Street, Room 401
Tallahassee, FL 32399-1450
Email: flaudgen_localgovt@aud.state.fl.us

- v. Any copies of financial reporting packages, reports or other information required to be submitted to the Department shall be submitted timely in accordance with Section 215.97, Florida Statutes, and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, as applicable.
 - vi. The Recipient, when submitting financial reporting packages to the Department for audits done in accordance with Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, should indicate the date the reporting package was delivered to the Recipient in correspondence accompanying the reporting package.
 - vii. Upon receipt, and within six months, the Department will review the Recipient's financial reporting package, including corrective action plans and management letters, to the extent necessary to determine whether timely and appropriate corrective action on all deficiencies has been taken pertaining to the state financial assistance provided through the Department by this Agreement. If the Recipient fails to have an audit conducted consistent with Section 215.97, Florida Statutes, the Department may take appropriate corrective action to enforce compliance.
 - viii. As a condition of receiving state financial assistance, the Recipient shall permit the Department, or its designee, DFS or the Auditor General access to the Recipient's records including financial statements, the independent auditor's working papers and project records as necessary. Records related to unresolved audit findings, appeals or litigation shall be retained until the action is complete or the dispute is resolved.
- c. The Recipient shall retain sufficient records demonstrating its compliance with the terms of this Agreement for a period of five years from the date the audit report is issued and shall allow the Department, or its designee, DFS or the Auditor General access to such records upon request. The Recipient shall ensure that the audit working papers are made available to the Department, or its designee, DFS or the Auditor General upon request for a period of five years from the date the audit report is issued unless extended in writing by the Department.

13. Restrictions, Prohibitions, Controls and Labor Provisions:

- a. A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity; may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.
- b. In accordance with Section 287.134, Florida Statutes, an entity or affiliate who has been placed on the Discriminatory Vendor List, kept by the Florida Department of Management Services, may not submit a bid on a contract to provide goods or services to a public entity; may not submit a bid on a contract with a public

entity for the construction or repair of a public building or public work; may not submit bids on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor or consultant under a contract with any public entity; and may not transact business with any public entity.

- c. An entity or affiliate who has had its Certificate of Qualification suspended, revoked, denied or have further been determined by the Department to be a non-responsible contractor may not submit a bid or perform work for the construction or repair of a public building or public work on a contract with the Recipient.
- d. No funds received pursuant to this Agreement may be expended for lobbying the Florida Legislature, judicial branch, or any state agency, in accordance with Section 216.347, Florida Statutes.
- e. The Department shall consider the employment by any contractor of unauthorized aliens a violation of Section 274A(e) of the Immigration and Nationality Act. If the contractor knowingly employs unauthorized aliens, such violation will be cause for unilateral cancellation of this Agreement.
- f. The Recipient shall:
 - i. Utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Recipient during the term of the contract; and
 - ii. Expressly require any subcontractors performing work or providing services pursuant to the state contract to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the contract term.
- g. The Recipient shall comply and require its contractors and subcontractors to comply with all terms and conditions of this Agreement and all federal, state, and local laws and regulations applicable to this Project.

14. Indemnification and Insurance:

- a. It is specifically agreed between the parties executing this Agreement that it is not intended by any of the provisions of any part of this Agreement to create in the public or any member thereof, a third-party beneficiary under this Agreement, or to authorize anyone not a party to this Agreement to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this Agreement. The Recipient guarantees the payment of all just claims for materials, supplies, tools, or labor and other just claims against the Recipient or any subcontractor, in connection with this Agreement.
- b. To the extent provided by law, Recipient shall indemnify, defend, and hold harmless the Department against any actions, claims, or damages arising out of, relating to, or resulting from negligent or wrongful act(s) of Recipient, or any of its officers, agents, or employees, acting within the scope of their office or employment, in connection with the rights granted to or exercised by Recipient hereunder, to the extent and within the limitations of Section 768.28, Florida Statutes. The foregoing indemnification shall not constitute a waiver of sovereign immunity beyond the limits set forth in Florida Statutes, Section 768.28, nor shall the same be construed to constitute agreement by Recipient to indemnify the Department for the negligent acts or omissions of the Department, its officers, agents, or employees, or for the acts of third parties. Nothing herein shall be construed as consent by Recipient to be sued by third parties in any manner arising out of this Agreement. This indemnification shall survive the termination of this Agreement.
- c. Recipient agrees to include the following indemnification in all contracts with contractors, subcontractors, consultants, or subconsultants (each referred to as "Entity" for the purposes of the below indemnification) who perform work in connection with this Agreement:

"To the extent provided by law, [ENTITY] shall indemnify, defend, and hold harmless the [RECIPIENT] and the State of Florida, Department of Transportation, including the Department's officers, agents, and employees, against any actions, claims, or damages arising out of, relating to, or resulting from negligent or wrongful act(s) of [ENTITY], or any of its officers, agents, or employees, acting within the scope of their office or employment, in connection with the rights

granted to or exercised by [ENTITY] hereunder, to the extent and within the limitations of Section 768.28, Florida Statutes.

The foregoing indemnification shall not constitute a waiver of sovereign immunity beyond the limits set forth in Florida Statutes, Section 768.28. Nor shall the same be construed to constitute agreement by [ENTITY] to indemnify [RECIPIENT] for the negligent acts or omissions of [RECIPIENT], its officers, agents, or employees, or third parties. Nor shall the same be construed to constitute agreement by [ENTITY] to indemnify the Department for the negligent acts or omissions of the Department, its officers, agents, or employees, or third parties. This indemnification shall survive the termination of this Agreement."

- d. The Recipient shall provide Workers' Compensation Insurance in accordance with Florida's Workers' Compensation law for all employees. If subletting any of the work, ensure that the subcontractor(s) and subconsultants have Workers' Compensation Insurance for their employees in accordance with Florida's Workers' Compensation law. If using "leased employees" or employees obtained through professional employer organizations ("PEO's"), ensure that such employees are covered by Workers' Compensation insurance through the PEO's or other leasing entities. Ensure that any equipment rental agreements that include operators or other personnel who are employees of independent contractors, sole proprietorships or partners are covered by insurance required under Florida's Workers' Compensation law.
- e. If the Recipient elects to self-perform the Project, and such self-performance is approved by the Department in accordance with the terms of this Agreement, the Recipient may self-insure and proof of self-insurance shall be provided to the Department. If the Recipient elects to hire a contractor or consultant to perform the Project, then the Recipient shall, or cause its contractor or consultant to carry Commercial General Liability insurance providing continuous coverage for all work or operations performed under the Agreement. Such insurance shall be no more restrictive than that provided by the latest occurrence form edition of the standard Commercial General Liability Coverage Form (ISO Form CG 00 01) as filed for use in the State of Florida. Recipient shall, or cause its contractor to cause the Department to be made an Additional Insured as to such insurance. Such coverage shall be on an "occurrence" basis and shall include Products/Completed Operations coverage. The coverage afforded to the Department as an Additional Insured shall be primary as to any other available insurance and shall not be more restrictive than the coverage afforded to the Named Insured. The limits of coverage shall not be less than \$1,000,000 for each occurrence and not less than a \$5,000,000 annual general aggregate, inclusive of amounts provided by an umbrella or excess policy. The limits of coverage described herein shall apply fully to the work or operations performed under the Agreement, and may not be shared with or diminished by claims unrelated to the Agreement. The policy/ies and coverage described herein may be subject to a deductible and such deductibles shall be paid by the Named Insured. No policy/ies or coverage described herein may contain or be subject to a Retention or a Self-Insured Retention unless the Recipient is a state agency or subdivision of the State of Florida that elects to self-perform the Project. Prior to the execution of the Agreement, and at all renewal periods which occur prior to final acceptance of the work, the Department shall be provided with an ACORD Certificate of Liability Insurance reflecting the coverage described herein. The Department shall be notified in writing within ten days of any cancellation, notice of cancellation, lapse, renewal, or proposed change to any policy or coverage described herein. The Department's approval or failure to disapprove any policy/ies, coverage, or ACORD Certificates shall not relieve or excuse any obligation to procure and maintain the insurance required herein, nor serve as a waiver of any rights or defenses the Department may have.
- f. When the Agreement includes the construction of a railroad grade crossing, railroad overpass or underpass structure, or any other work or operations within the limits of the railroad right-of-way, including any encroachments thereon from work or operations in the vicinity of the railroad right-of-way, the Recipient shall, or cause its contractor to, in addition to the insurance coverage required above, procure and maintain Railroad Protective Liability Coverage (ISO Form CG 00 35) where the railroad is the Named Insured and where the limits are not less than \$2,000,000 combined single limit for bodily injury and/or property damage per occurrence, and with an annual aggregate limit of not less than \$6,000,000. The railroad shall also be added along with the Department as an Additional Insured on the policy/ies procured pursuant to the paragraph above. Prior to the execution of the Agreement, and at all renewal periods which occur prior to final acceptance of the work, both the Department and the railroad shall be provided with an ACORD Certificate of Liability Insurance reflecting the coverage described herein. The insurance described herein

shall be maintained through final acceptance of the work. Both the Department and the railroad shall be notified in writing within ten days of any cancellation, notice of cancellation, renewal, or proposed change to any policy or coverage described herein. The Department's approval or failure to disapprove any policy/ies, coverage, or ACORD Certificates shall not relieve or excuse any obligation to procure and maintain the insurance required herein, nor serve as a waiver of any rights the Department may have.

- g. When the Agreement involves work on or in the vicinity of utility-owned property or facilities, the utility shall be added along with the Department as an Additional Insured on the Commercial General Liability policy/ies procured above.

15. Miscellaneous:

- a. In no event shall any payment to the Recipient constitute or be construed as a waiver by the Department of any breach of covenant or any default which may then exist on the part of the Recipient and the making of such payment by the Department, while any such breach or default shall exist, shall in no way impair or prejudice any right or remedy available to the Department with respect to such breach or default.
- b. If any provision of this Agreement is held invalid, the remainder of this Agreement shall not be affected. In such an instance, the remainder would then continue to conform to the terms and requirements of applicable law.
- c. The Recipient and the Department agree that the Recipient, its employees, contractors, subcontractors, consultants, and subconsultants are not agents of the Department as a result of this Agreement.
- d. By execution of the Agreement, the Recipient represents that it has not paid and, also agrees not to pay, any bonus or commission for the purpose of obtaining an approval of its application for the financing hereunder.
- e. Nothing in the Agreement shall require the Recipient to observe or enforce compliance with any provision or perform any act or do any other thing in contravention of any applicable state law. If any of the provisions of the Agreement violate any applicable state law, the Recipient will at once notify the Department in writing in order that appropriate changes and modifications may be made by the Department and the Recipient to the end that the Recipient may proceed as soon as possible with the Project.
- f. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which shall constitute the same Agreement. A facsimile or electronic transmission of this Agreement with a signature on behalf of a party will be legal and binding on such party.
- g. The Department reserves the right to unilaterally terminate this Agreement for failure by the Recipient to comply with the provisions of Chapter 119, Florida Statutes.
- h. The Recipient agrees to comply with Section 20.055(5), Florida Statutes, and to incorporate in all subcontracts the obligation to comply with Section 20.055(5), Florida Statutes
- i. This Agreement shall be governed by and construed in accordance with the laws of the State of Florida. In the event of a conflict between any portion of the contract and Florida law, the laws of Florida shall prevail. The Recipient agrees to waive forum and venue and that the Department shall determine the forum and venue in which any dispute under this Agreement is decided.
- j. This Agreement does not involve the purchase of Tangible Personal Property, as defined in Chapter 273, Florida Statutes.

16. Exhibits.

- a. **Exhibits A, B, D, F, and J** are attached to and incorporated into this Agreement.
- b. ☐ The Project will involve construction, therefore, **Exhibit "C"**, Engineer's Certification of Compliance is attached and incorporated into this Agreement.

- c. ☐ Alternative Advance Payment Financial Provisions are used on this Project. If an Alternative Pay Method is used on this Project, then **Exhibit "H"**, Alternative Advance Payment Financial Provisions, is attached and incorporated into this Agreement.
- d. ☐ This Project utilizes Advance Project Reimbursement. If this Project utilizes Advance Project Reimbursement, then **Exhibit "K"**, Advance Project Reimbursement is attached and incorporated into this Agreement.
- e. ☒ A portion or all of the Project will utilize the Department's right-of-way and, therefore, **Exhibit O, Terms and Conditions of Construction in Department Right-of-Way**, is attached and incorporated into this Agreement.
- f. ☐ The following Exhibit(s), in addition to those listed in 16.a. through 16.f., are attached and incorporated into this Agreement: _____

g. Exhibit and Attachment List

Exhibit A: Project Description and Responsibilities

Exhibit B: Schedule of Financial Assistance

*Exhibit C: Engineer's Certification of Compliance

Exhibit D: Recipient Resolution

Exhibit F: Contract Payment Requirements

*Exhibit H: Alternative Advance Payment Financial Provisions

Exhibit J: State Financial Assistance (Florida Single Audit Act)

*Exhibit K: Advance Project Reimbursement

*Exhibit O: Terms and Conditions of Construction in Department Right-of-Way

*Additional Exhibit(s): _____

*Indicates that the Exhibit is only attached and incorporated if applicable box is selected.

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STATE-FUNDED GRANT AGREEMENT

525-01-60
PROGRAM MANAGEMENT
10/2020

EXHIBIT "D"

IN WITNESS WHEREOF, the Parties have executed this Agreement on the day and year written above.

RECIPIENT CITY OF PORT ORANGE

STATE OF FLORIDA,
DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

Title: _____

By: _____

Name: Loreen C. Bobo, P.E.

Title: Director of Transportation Development

Legal Review:

By: _____

Name: _____

EXHIBIT A

PROJECT DESCRIPTION AND RESPONSIBILITIES

FPN: 439865-3-34-01

This exhibit forms an integral part of the Local Agency Program Agreement between the State of Florida, Department of Transportation and

the City of Port Orange (the Recipient)

PROJECT LOCATION:

☐ The project is on the National Highway System.

☒ The project is on the State Highway System.

PROJECT LENGTH AND MILE POST LIMITS: See Project Description Below

PROJECT DESCRIPTION:

This SunTrail project is located within the City of Port Orange and is part of the St. Johns River to Sea Loop Trail system. This segment, of the much larger trail system, begins south of the intersection of Spruce Creek Road and Selin Circle. The trail will extend northerly along the east side of Spruce Creek Road towards Oak Street. In the event acquisition of right-of-way or easement is unsuccessful, then the trail will extend northerly along the west side of Spruce Creek Road towards Oak Street and cross over Spruce Creek Road and continue along the east side of Halifax Canal from Oak Street to Dunlawton Avenue utilizing the existing 8' wide trail. The proposed trail will then continue along Spruce Creek Road from Dunlawton Avenue to Canal View Boulevard. The proposed trail continues through a vacant parcel to Herbert Street, connecting to the existing trail segment. Total project length is approximately 0.652 miles. Within the vacant parcel, owned by the City of Port Orange, an eight-foot wide, 300-foot long boardwalk is proposed in the wetland area. The entire length of the proposed sidewalk is located within the special flood hazard area and floodplain impacts and compensatory storage calculations and design will be required.

Project scope includes design of trail and lighting improvements along the trail route to enhance safety, particularly at points of conflict such as at driveways and roadway crossings. Design services shall include topographic/boundary survey, geotechnical investigations, environmental assessment(s), and engineering design. Utility coordination will be required. Coordination for permitting needs are anticipated. Right of way acquisition or any easement/easement modifications may be required and will be determined during the design phase. All pedestrian accommodations shall adhere to current ADA standards. Design of this trail shall follow the PD&E study finalized in April 2020. In addition, the SunTrail width will need to follow the latest FDOT Design Manual criteria, per Section 224.4, Widths. If a variance for the SunTrail width is needed, it will be coordinated with the Department.

SPECIAL CONSIDERATIONS BY RECIPIENT:

The Recipient is required to provide a copy of the design plans for the Department's review and approval to coordinate permitting with the Department, and notify the Department prior to commencement of any right-of-way activities.

If and when real property rights are to be acquired for a transportation facility, a scaled drawing must be prepared to clearly show the right-of-way to be acquired. It must show sufficient technical data, including land ties, to permit the preparation of legal descriptions for use in acquisition documents, and serve as an aid in appraisal and acquisition. It is supported by a Control Survey Map (certified survey) and does not purport to be a survey. This map provides the certified survey support

for the preparation of right of way related maps and is a depiction of the right of way survey field work performed for a specific transportation project.

Invoices, progress reports and other supporting documentation shall be submitted no more than monthly and no less than quarterly to D5-LocalPrograms@dot.state.fl.us

Pursuant to the enabling legislation, Section 339.81, F.S., components of the Sun Trail Network will not include:

Sidewalks; nature trails; loop trails wholly within a single park or natural area;

On-road facilities, such as bicycle lanes of routes other than on-road facilities that are no longer than one-half mile connecting two or more non-motorized trails, if the provision of non-road facilities is infeasible and if such on-road facilities are signed and marked for non-motorized use; an exception is made for on-road components of the Florida Keys Overseas Heritage Trail.

Allocation of Sun Trail funds will not include the development of amenities associated with trail projects. These amenities include but are not limited to:

- Benches, Trail Furniture or Seating Areas;
- Bicycle Racks, Air Stations or Lockers;
- Buildings, Restrooms, Wayside Structures or Overlooks, Shelters or Picnic Pavilions;
- Kiosks (Regulatory and Safety Signage Permitted);
- Landscaping (Trail Stabilization Permitted);
- Litter or Recycle Receptacles or Doggie Bag Dispensers;
- Parking Areas or Trailheads;
- Playgrounds, Fitness Equipment or Structures;
- Promotional or Educational Materials;
- Sculptures, Fountains, or Art; and
- Water Fountains, Spigots or Showers.

The Recipient shall commence the project's activities subsequent to the execution of this Agreement and shall perform in accordance with the following schedule:

- a) 30% Plans Submittal to be completed by October 18, 2021.
- b) 60% Plans Submittal to be completed by February 21, 2022.
- c) 90% Plans Submittal to be completed by April 25, 2022.
- d) Final Plans Submittal to be completed by June 21, 2022.

If this schedule cannot be met, the Recipient will notify the Department in writing with a revised schedule or the project is subject to the withdrawal of funding.

SPECIAL CONSIDERATIONS BY DEPARTMENT:

In the event the Project costs exceed the cost included in Exhibit "B", Schedule of Financial Assistance, the Recipient will be solely responsible to provide the additional funds that are necessary to complete the Project.

The project funding may be reduced to an amount equal to the award amount and/or the actual contract costs.

The remainder of this page intentionally left blank.

EXHIBIT B
SCHEDULE OF FINANCIAL ASSISTANCE

RECIPIENT NAME & BILLING ADDRESS: City of Port Orange 1000 City Center Circle Port Orange, Florida 32129	FINANCIAL PROJECT NUMBER: 439865-3-34-01
--	--

I. PHASE OF WORK by Fiscal Year:	FY 2020/2021	FY	FY	TOTAL
Design- Phase 34	\$ 200,000.00	\$ 0.00	\$ 0.00	\$200,000.00
Maximum Department Participation - (TLWR)	N/A% or \$ 200,000.00	N/A% or \$ 0.00	N/A% or \$ 0.00	N/A% or \$ 200,000.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	N/A% or \$ 0.00	N/A% or \$ 0.00	N/A% or \$ 0.00	N/A% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00
Right of Way- Phase 44	\$ 0.00	\$ 0.00	\$ 0.00	\$0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	% or \$ 0.00	% or \$ 0.00	% or \$ 0.00	% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00
Construction/CEI - Phase 54	\$ 0.00	\$ 0.00	\$ 0.00	\$0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	% or \$ 0.00	% or \$ 0.00	% or \$ 0.00	% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00

EXHIBIT "D"

Insert Phase and Number (if applicable)	\$ 0.00	\$ 0.00	0.00	\$0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Maximum Department Participation - (Insert Program Name)	% or \$	% or \$	% or \$	% or \$ 0.00
Local Participation (Any applicable waiver noted in Exhibit "A")	% or \$ 0.00	% or \$ 0.00	% or \$ 0.00	% or \$0.00
In-Kind Contribution	\$	\$	\$	\$ 0.00
Cash	\$	\$	\$	\$ 0.00
Combination In-Kind/Cash	\$	\$	\$	\$ 0.00
II. TOTAL PROJECT COST:	\$200,000.00	\$0.00	\$0.00	\$200,000.00

COST ANALYSIS CERTIFICATION AS REQUIRED BY SECTION 216.3475, FLORIDA STATUTES:

I certify that the cost for each line item budget category has been evaluated and determined to be allowable, reasonable, and necessary as required by Section 216.3475, F.S. Documentation is on file evidencing the methodology used and the conclusions reached.

Amir Asgarinik

District Grant Manager Name

Signature

Date

EXHIBIT "D"

EXHIBIT D

RECIPIENT RESOLUTION

The Recipient's Resolution authorizing entry into this Agreement is attached and incorporated into this Agreement.

EXHIBIT F

CONTRACT PAYMENT REQUIREMENTS

Florida Department of Financial Services, Reference Guide for State Expenditures
Cost Reimbursement Contracts

Invoices for cost reimbursement contracts must be supported by an itemized listing of expenditures by category (salary, travel, expenses, etc.). Supporting documentation shall be submitted for each amount for which reimbursement is being claimed indicating that the item has been paid. Documentation for each amount for which reimbursement is being claimed must indicate that the item has been paid. Check numbers may be provided in lieu of copies of actual checks. Each piece of documentation should clearly reflect the dates of service. Only expenditures for categories in the approved agreement budget may be reimbursed. These expenditures must be allowable (pursuant to law) and directly related to the services being provided.

Listed below are types and examples of supporting documentation for cost reimbursement agreements:

Salaries: Timesheets that support the hours worked on the project or activity must be kept. A payroll register, or similar documentation should be maintained. The payroll register should show gross salary charges, fringe benefits, other deductions and net pay. If an individual for whom reimbursement is being claimed is paid by the hour, a document reflecting the hours worked times the rate of pay will be acceptable.

Fringe benefits: Fringe benefits should be supported by invoices showing the amount paid on behalf of the employee, e.g., insurance premiums paid. If the contract specifically states that fringe benefits will be based on a specified percentage rather than the actual cost of fringe benefits, then the calculation for the fringe benefits amount must be shown. Exception: Governmental entities are not required to provide check numbers or copies of checks for fringe benefits.

Travel: Reimbursement for travel must be in accordance with s. 112.061, F.S., which includes submission of the claim on the approved state travel voucher along with supporting receipts and invoices.

Other direct costs: Reimbursement will be made based on paid invoices/receipts and proof of payment processing (cancelled/processed checks and bank statements). If nonexpendable property is purchased using state funds, the contract should include a provision for the transfer of the property to the State when services are terminated. Documentation must be provided to show compliance with DMS Rule 60A-1.017, F.A.C., regarding the requirements for contracts which include services and that provide for the contractor to purchase tangible personal property as defined in s. 273.02, F.S., for subsequent transfer to the State.

Indirect costs: If the contract stipulates that indirect costs will be paid based on a specified rate, then the calculation should be shown. Indirect costs must be in the approved agreement budget and the entity must be able to demonstrate that the costs are not duplicated elsewhere as direct costs. All indirect cost rates must be evaluated for reasonableness and for allowability and must be allocated consistently.

Contracts between state agencies may submit alternative documentation to substantiate the reimbursement request, which may be in the form of FLAIR reports or other detailed reports.

The Florida Department of Financial Services, online Reference Guide for State Expenditures can be found at this web address <https://www.myfloridacfo.com/Division/AA/Manuals/documents/ReferenceGuideforStateExpenditures.pdf>.

EXHIBIT "D"

EXHIBIT J**STATE FINANCIAL ASSISTANCE (FLORIDA SINGLE AUDIT ACT)****THE STATE RESOURCES AWARDED PURSUANT TO THIS AGREEMENT CONSIST OF THE FOLLOWING:**

Awarding Agency: Florida Department of Transportation

**State Project Title
and CSFA
Number:**

- ☐ County Incentive Grant Program (CIGP), (CSFA 55.008)
- ☐ Small County Outreach Program (SCOP), (CSFA 55.009)
- ☐ Small County Road Assistance Program (SCRAP), (CSFA 55.016)
- ☐ Transportation Regional Incentive Program (TRIP), (CSFA 55.026)
- ☒ Florida Shared-Use Nonmotorized (SUN) Trail Network Program, (CSFA 55.038)

***Award Amount:** \$200,000.00

*The state award amount may change with supplemental agreements

Specific project information for CSFA Number is provided at: <https://apps.fldfs.com/fsaa/searchCatalog.aspx>

COMPLIANCE REQUIREMENTS APPLICABLE TO STATE RESOURCES AWARDED PURSUANT TO THIS AGREEMENT:

State Project Compliance Requirements for CSFA Number are provided at:
<https://apps.fldfs.com/fsaa/searchCompliance.aspx>

The State Projects Compliance Supplement is provided at: <https://apps.fldfs.com/fsaa/compliance.aspx>

EXHIBIT O**TERMS AND CONDITIONS OF CONSTRUCTION IN DEPARTMENT RIGHT OF WAY****Section 10.e. of the Agreement is amended as follows for Construction on the Department's Right of Way.**

1. If the Project involves construction on, under, or over the Department's right-of-way, the design work for all portions of the Project to be constructed on, under, or over the Department's right-of-way shall be submitted to the Department for review prior to any work being commenced, and the following provisions shall apply:

- a.** The Project shall be designed and constructed in accordance with the latest edition of the Department's Standard Specifications for Road and Bridge Construction and Department Design Standards and Manual of Uniform Traffic Control Devices ("MUTCD"). The following guidelines shall apply as deemed appropriate by the Department: the Department Structures Design Manual, AASHTO Guide Specifications for the Design of Pedestrian Bridges, AASHTO LRFD Bridge Design Specifications, the Florida Department of Transportation Design Manual ("FDM") and the Department Traffic Engineering Manual.

Designs that do not meet Department standards may be rejected by the Department at its sole discretion. The Department may allocate Department-managed resources to facilitate compliance with applicable design standards. If changes to the Department approved plans are required, the Recipient shall notify the Department of the changes and receive approval from the Department prior to the changes being constructed. The Recipient shall maintain the area of the Project, at all times, and coordinate any work needs of the Department during construction of the Project.

- b.** The Recipient shall notify the Department a minimum of 48 hours before beginning construction within, under, or over Department right-of-way. The Recipient shall notify the Department should construction be suspended for more than 5 working days. The Department contact person for construction is D5-ConstructionSpecialProjects@dot.state.fl.us.
- c.** The Recipient shall be responsible for monitoring construction operations and the maintenance of traffic ("MOT") throughout the course of the Project in accordance with the latest edition of the Department Standard Specifications, section 102. The Recipient is responsible for the development of a MOT plan and making any changes to that plan as necessary. The MOT plan shall be in accordance with the latest version of the Department Design Standards, Index 600 series. Any MOT plan developed by the Recipient that deviates from the Department Design Standards must be signed and sealed by a professional engineer. MOT plans will require approval by the Department prior to implementation.
- d.** The Recipient shall be responsible for locating all existing utilities, both aerial and underground, and for ensuring that all utility locations be accurately documented on the construction plans. All utility conflicts shall be fully resolved directly with the applicable utility.
- e.** The Recipient will be responsible for obtaining all permits that may be required by other agencies or local governmental entities.
- f.** It is hereby agreed by the Parties that this Agreement creates a permissive use only and all improvements located on, under, or over the Department's right-of-way resulting from this Agreement shall become the property of the Department. Neither the granting of the permission to use the Department right-of-way nor the placing of facilities upon the Department property shall operate to create or vest any property right to or in the Recipient, except as may otherwise be provided in separate agreements. The Recipient shall not acquire any right, title, interest or estate in Department right-of-way, of any nature or kind whatsoever, by virtue of the execution, operation, effect, or performance of this Agreement including, but not limited to, the Recipient's use, occupancy or possession of Department right-of-way. The Parties agree that this Agreement does not, and shall not be construed to, grant credit for any future transportation concurrency requirements pursuant to Chapter 163, Florida Statutes.

- g. The Recipient shall not cause any liens or encumbrances to attach to any portion of the Department's property, including but not limited to, the Department's right-of-way.
- h. The Recipient shall perform all required testing associated with the design and construction of the Project. Testing results shall be entered into the department's Materials Testing and Certification database application and the department must provide the final Materials Certification for the Project. The Department shall have the right to perform its own independent testing during the course of the Project.
- i. The Recipient shall exercise the rights granted herein and shall otherwise perform this Agreement in a good and workmanlike manner, with reasonable care, in accordance with the terms and provisions of this Agreement and all applicable federal, state, local, administrative, regulatory, safety and environmental laws, codes, rules, regulations, policies, procedures, guidelines, standards and permits, as the same may be constituted and amended from time to time, including, but not limited to, those of the Department, applicable Water Management District, Florida Department of Environmental Protection, Environmental Protection Recipient, the Army Corps of Engineers, the United States Coast Guard and local governmental entities.
- j. If the Department determines a condition exists which threatens the public's safety, the Department may, at its discretion, cause construction operations to cease and immediately have any potential hazards removed from on, under, or over its right-of-way at the sole cost, expense, and effort of the Recipient. The Recipient shall bear all construction delay costs incurred by the Department.
- k. The Recipient shall be responsible to maintain and restore all features that might require relocation within the Department right-of-way.
- l. The Recipient will be solely responsible for clean up or restoration required to correct any environmental or health hazards that may result from construction operations.
- m. The acceptance procedure will include a final "walk-through" by Recipient and Department personnel. Upon completion of construction, the Recipient will be required to submit to the Department final as-built plans and an engineering certification that construction was completed in accordance to the plans. Submittal of the final as-built plans shall include one complete set of the signed and sealed plans on 11" X 17" plan sheets and an electronic copy prepared in Portable Document Format (PDF). Prior to the termination of this Agreement, the Recipient shall remove its presence, including, but not limited to, all of the Recipient's property, machinery, and equipment from Department right-of-way and shall restore those portions of Department right of way disturbed or otherwise altered by the Project to substantially the same condition that existed immediately prior to the commencement of the Project.
- n. If the Department determines that the Project is not completed in accordance with the provisions of this Agreement, the Department shall deliver written notification of such to the Recipient. The Recipient shall have thirty (30) days from the date of receipt of the Department's written notice, or such other time as the Recipient and the Department mutually agree to in writing, to complete the Project and provide the Department with written notice of the same (the "Notice of Completion"). If the Recipient fails to timely deliver the Notice of Completion, or if it is determined that the Project is not properly completed after receipt of the Notice of Completion, the Department, within its discretion may: 1) provide the Recipient with written authorization granting such additional time as the Department deems appropriate to correct the deficiency(ies); or 2) correct the deficiency(ies) at the Recipient's sole cost and expense, without Department liability to the Recipient for any resulting loss or damage to property, including, but not limited to, machinery and equipment. If the Department elects to correct the deficiency(ies), the Department shall provide the Recipient with an invoice for the costs incurred by the Department and the Recipient shall pay the invoice within thirty (30) days of the date of the invoice.
- o. The Recipient shall implement best management practices for erosion and pollution control to prevent violation of state water quality standards. The Recipient shall be responsible for the correction of any erosion, shoaling, or water quality problems that result from the construction of the Project.

- p. Portable Traffic Monitoring Site (PTMS) or a Telemetry Traffic Monitoring Site (TTMS) may exist within the vicinity of your proposed work. It is the responsibility of the Recipient to locate and avoid damage to these sites. If a PTMS or TTMS is encountered during construction, the Department must be contacted immediately.
- q. During construction, highest priority must be given to pedestrian safety. If permission is granted to temporarily close a sidewalk, it should be done with the express condition that an alternate route will be provided, and shall continuously maintain pedestrian features to meet Americans Disability Act (ADA) standards.
- r. Restricted hours of operation will be from TO BE DETERMINED PRIOR TO CONSTRUCTION, (DAYS OF THE WEEK FOR RESTRICTED OPERATION TO BE DETERMINED), unless otherwise approved by the Operations Engineer, or designee.
- s. Lane closures on the state road system must be coordinated with the Public Information Office at least two weeks prior to the closure. The contact information for the Department's Public Information Office is:

D5-PIO@dot.state.fl.us

Note: (Highlighted sections indicate need to confirm information with District Office or appropriate DOT person managing the Agreement)

EXHIBIT F**CONTRACT PAYMENT REQUIREMENTS****Florida Department of Financial Services, Reference Guide for State Expenditures
Cost Reimbursement Contracts**

Invoices for cost reimbursement contracts must be supported by an itemized listing of expenditures by category (salary, travel, expenses, etc.). Supporting documentation shall be submitted for each amount for which reimbursement is being claimed indicating that the item has been paid. Documentation for each amount for which reimbursement is being claimed must indicate that the item has been paid. Check numbers may be provided in lieu of copies of actual checks. Each piece of documentation should clearly reflect the dates of service. Only expenditures for categories in the approved agreement budget may be reimbursed. These expenditures must be allowable (pursuant to law) and directly related to the services being provided.

Listed below are types and examples of supporting documentation for cost reimbursement agreements:

Salaries: Timesheets that support the hours worked on the project or activity must be kept. A payroll register, or similar documentation should be maintained. The payroll register should show gross salary charges, fringe benefits, other deductions and net pay. If an individual for whom reimbursement is being claimed is paid by the hour, a document reflecting the hours worked times the rate of pay will be acceptable.

Fringe benefits: Fringe benefits should be supported by invoices showing the amount paid on behalf of the employee, e.g., insurance premiums paid. If the contract specifically states that fringe benefits will be based on a specified percentage rather than the actual cost of fringe benefits, then the calculation for the fringe benefits amount must be shown. Exception: Governmental entities are not required to provide check numbers or copies of checks for fringe benefits.

Travel: Reimbursement for travel must be in accordance with s. 112.061, F.S., which includes submission of the claim on the approved state travel voucher along with supporting receipts and invoices.

Other direct costs: Reimbursement will be made based on paid invoices/receipts and proof of payment processing (cancelled/processed checks and bank statements). If nonexpendable property is purchased using state funds, the contract should include a provision for the transfer of the property to the State when services are terminated. Documentation must be provided to show compliance with DMS Rule 60A-1.017, F.A.C., regarding the requirements for contracts which include services and that provide for the contractor to purchase tangible personal property as defined in s. 273.02, F.S., for subsequent transfer to the State.

Indirect costs: If the contract stipulates that indirect costs will be paid based on a specified rate, then the calculation should be shown. Indirect costs must be in the approved agreement budget and the entity must be able to demonstrate that the costs are not duplicated elsewhere as direct costs. All indirect cost rates must be evaluated for reasonableness and for allowability and must be allocated consistently.

Contracts between state agencies may submit alternative documentation to substantiate the reimbursement request, which may be in the form of FLAIR reports or other detailed reports.

The Florida Department of Financial Services, online Reference Guide for State Expenditures can be found at this web address <https://www.myfloridacfo.com/Division/AA/Manuals/documents/ReferenceGuideforStateExpenditures.pdf>.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STATE-FUNDED GRANT AGREEMENT**EXHIBIT J****STATE FINANCIAL ASSISTANCE (FLORIDA SINGLE AUDIT ACT)****THE STATE RESOURCES AWARDED PURSUANT TO THIS AGREEMENT CONSIST OF THE FOLLOWING:****Awarding Agency:** Florida Department of Transportation**State Project Title
and CSFA
Number:**

- ☐ County Incentive Grant Program (CIGP), (CSFA 55.008)
- ☐ Small County Outreach Program (SCOP), (CSFA 55.009)
- ☐ Small County Road Assistance Program (SCRAP), (CSFA 55.016)
- ☐ Transportation Regional Incentive Program (TRIP), (CSFA 55.026)
- ☒ Florida Shared-Use Nonmotorized (SUN) Trail Network Program,
(CSFA 55.038)

***Award Amount:** \$200,000.00

*The state award amount may change with supplemental agreements

Specific project information for CSFA Number is provided at: <https://apps.fldfs.com/fsaa/searchCatalog.aspx>**COMPLIANCE REQUIREMENTS APPLICABLE TO STATE RESOURCES AWARDED PURSUANT TO THIS AGREEMENT:**State Project Compliance Requirements for CSFA Number are provided at:
<https://apps.fldfs.com/fsaa/searchCompliance.aspx>The State Projects Compliance Supplement is provided at: <https://apps.fldfs.com/fsaa/compliance.aspx>

EXHIBIT O**TERMS AND CONDITIONS OF CONSTRUCTION IN DEPARTMENT RIGHT OF WAY****Section 10.e. of the Agreement is amended as follows for Construction on the Department's Right of Way.**

1. If the Project involves construction on, under, or over the Department's right-of-way, the design work for all portions of the Project to be constructed on, under, or over the Department's right-of-way shall be submitted to the Department for review prior to any work being commenced, and the following provisions shall apply:

- a.** The Project shall be designed and constructed in accordance with the latest edition of the Department's Standard Specifications for Road and Bridge Construction and Department Design Standards and Manual of Uniform Traffic Control Devices ("MUTCD"). The following guidelines shall apply as deemed appropriate by the Department: the Department Structures Design Manual, AASHTO Guide Specifications for the Design of Pedestrian Bridges, AASHTO LRFD Bridge Design Specifications, the Florida Department of Transportation Design Manual ("FDM") and the Department Traffic Engineering Manual.

Designs that do not meet Department standards may be rejected by the Department at its sole discretion. The Department may allocate Department-managed resources to facilitate compliance with applicable design standards. If changes to the Department approved plans are required, the Recipient shall notify the Department of the changes and receive approval from the Department prior to the changes being constructed. The Recipient shall maintain the area of the Project, at all times, and coordinate any work needs of the Department during construction of the Project.

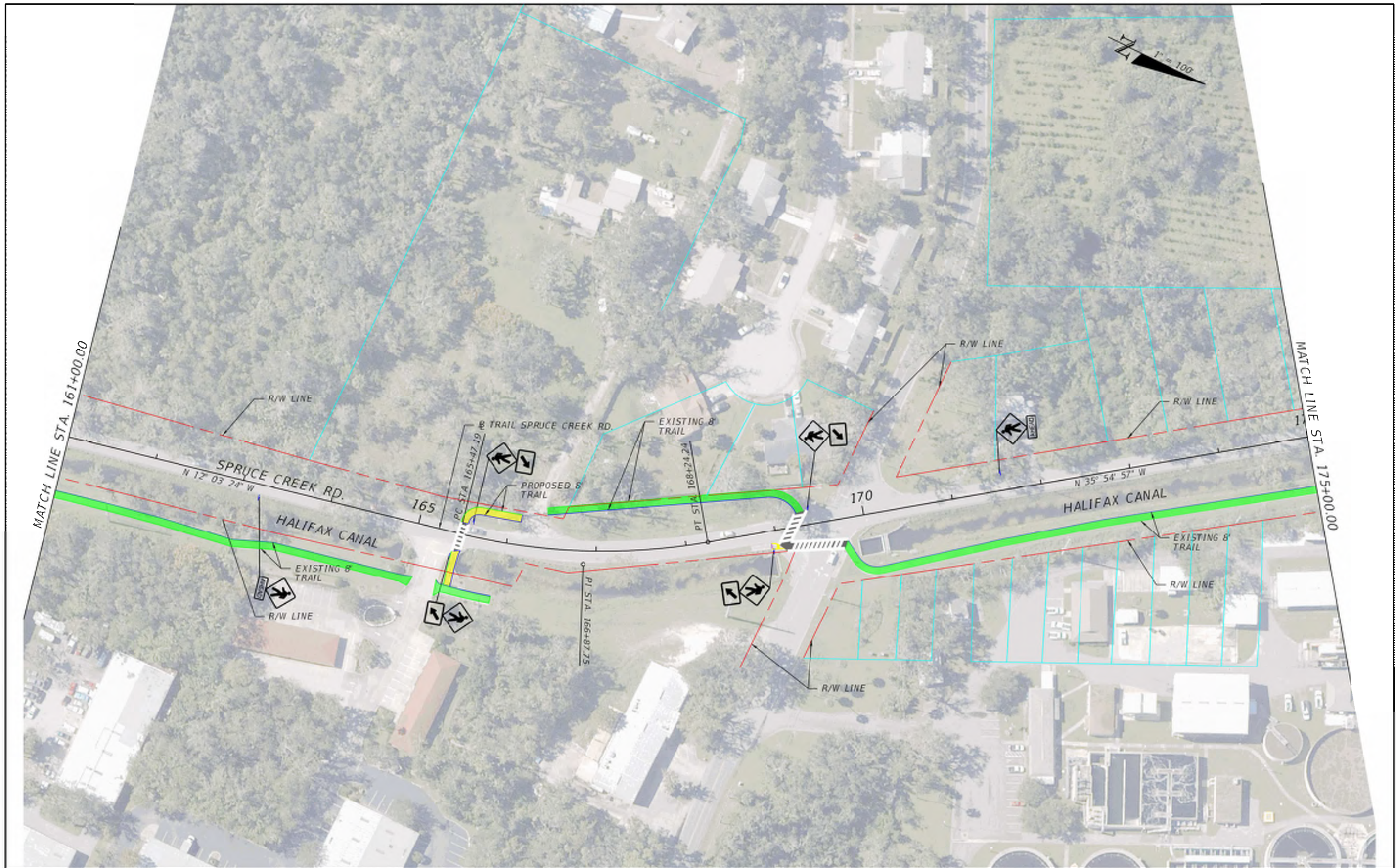
- b.** The Recipient shall notify the Department a minimum of 48 hours before beginning construction within, under, or over Department right-of-way. The Recipient shall notify the Department should construction be suspended for more than 5 working days. The Department contact person for construction is D5-ConstructionSpecialProjects@dot.state.fl.us.
- c.** The Recipient shall be responsible for monitoring construction operations and the maintenance of traffic ("MOT") throughout the course of the Project in accordance with the latest edition of the Department Standard Specifications, section 102. The Recipient is responsible for the development of a MOT plan and making any changes to that plan as necessary. The MOT plan shall be in accordance with the latest version of the Department Design Standards, Index 600 series. Any MOT plan developed by the Recipient that deviates from the Department Design Standards must be signed and sealed by a professional engineer. MOT plans will require approval by the Department prior to implementation.
- d.** The Recipient shall be responsible for locating all existing utilities, both aerial and underground, and for ensuring that all utility locations be accurately documented on the construction plans. All utility conflicts shall be fully resolved directly with the applicable utility.
- e.** The Recipient will be responsible for obtaining all permits that may be required by other agencies or local governmental entities.
- f.** It is hereby agreed by the Parties that this Agreement creates a permissive use only and all improvements located on, under, or over the Department's right-of-way resulting from this Agreement shall become the property of the Department. Neither the granting of the permission to use the Department right-of-way nor the placing of facilities upon the Department property shall operate to create or vest any property right to or in the Recipient, except as may otherwise be provided in separate agreements. The Recipient shall not acquire any right, title, interest or estate in Department right-of-way, of any nature or kind whatsoever, by virtue of the execution, operation, effect, or performance of this Agreement including, but not limited to, the Recipient's use, occupancy or possession of Department right-of-way. The Parties agree that this Agreement does not, and shall not be construed to, grant credit for any future transportation concurrency requirements pursuant to Chapter 163, Florida Statutes.

- g. The Recipient shall not cause any liens or encumbrances to attach to any portion of the Department's property, including but not limited to, the Department's right-of-way.
- h. The Recipient shall perform all required testing associated with the design and construction of the Project. Testing results shall be entered into the department's Materials Testing and Certification database application and the department must provide the final Materials Certification for the Project. The Department shall have the right to perform its own independent testing during the course of the Project.
- i. The Recipient shall exercise the rights granted herein and shall otherwise perform this Agreement in a good and workmanlike manner, with reasonable care, in accordance with the terms and provisions of this Agreement and all applicable federal, state, local, administrative, regulatory, safety and environmental laws, codes, rules, regulations, policies, procedures, guidelines, standards and permits, as the same may be constituted and amended from time to time, including, but not limited to, those of the Department, applicable Water Management District, Florida Department of Environmental Protection, Environmental Protection Recipient, the Army Corps of Engineers, the United States Coast Guard and local governmental entities.
- j. If the Department determines a condition exists which threatens the public's safety, the Department may, at its discretion, cause construction operations to cease and immediately have any potential hazards removed from on, under, or over its right-of-way at the sole cost, expense, and effort of the Recipient. The Recipient shall bear all construction delay costs incurred by the Department.
- k. The Recipient shall be responsible to maintain and restore all features that might require relocation within the Department right-of-way.
- l. The Recipient will be solely responsible for clean up or restoration required to correct any environmental or health hazards that may result from construction operations.
- m. The acceptance procedure will include a final "walk-through" by Recipient and Department personnel. Upon completion of construction, the Recipient will be required to submit to the Department final as-built plans and an engineering certification that construction was completed in accordance to the plans. Submittal of the final as-built plans shall include one complete set of the signed and sealed plans on 11" X 17" plan sheets and an electronic copy prepared in Portable Document Format (PDF). Prior to the termination of this Agreement, the Recipient shall remove its presence, including, but not limited to, all of the Recipient's property, machinery, and equipment from Department right-of-way and shall restore those portions of Department right of way disturbed or otherwise altered by the Project to substantially the same condition that existed immediately prior to the commencement of the Project.
- n. If the Department determines that the Project is not completed in accordance with the provisions of this Agreement, the Department shall deliver written notification of such to the Recipient. The Recipient shall have thirty (30) days from the date of receipt of the Department's written notice, or such other time as the Recipient and the Department mutually agree to in writing, to complete the Project and provide the Department with written notice of the same (the "Notice of Completion"). If the Recipient fails to timely deliver the Notice of Completion, or if it is determined that the Project is not properly completed after receipt of the Notice of Completion, the Department, within its discretion may: 1) provide the Recipient with written authorization granting such additional time as the Department deems appropriate to correct the deficiency(ies); or 2) correct the deficiency(ies) at the Recipient's sole cost and expense, without Department liability to the Recipient for any resulting loss or damage to property, including, but not limited to, machinery and equipment. If the Department elects to correct the deficiency(ies), the Department shall provide the Recipient with an invoice for the costs incurred by the Department and the Recipient shall pay the invoice within thirty (30) days of the date of the invoice.
- o. The Recipient shall implement best management practices for erosion and pollution control to prevent violation of state water quality standards. The Recipient shall be responsible for the correction of any erosion, shoaling, or water quality problems that result from the construction of the Project.

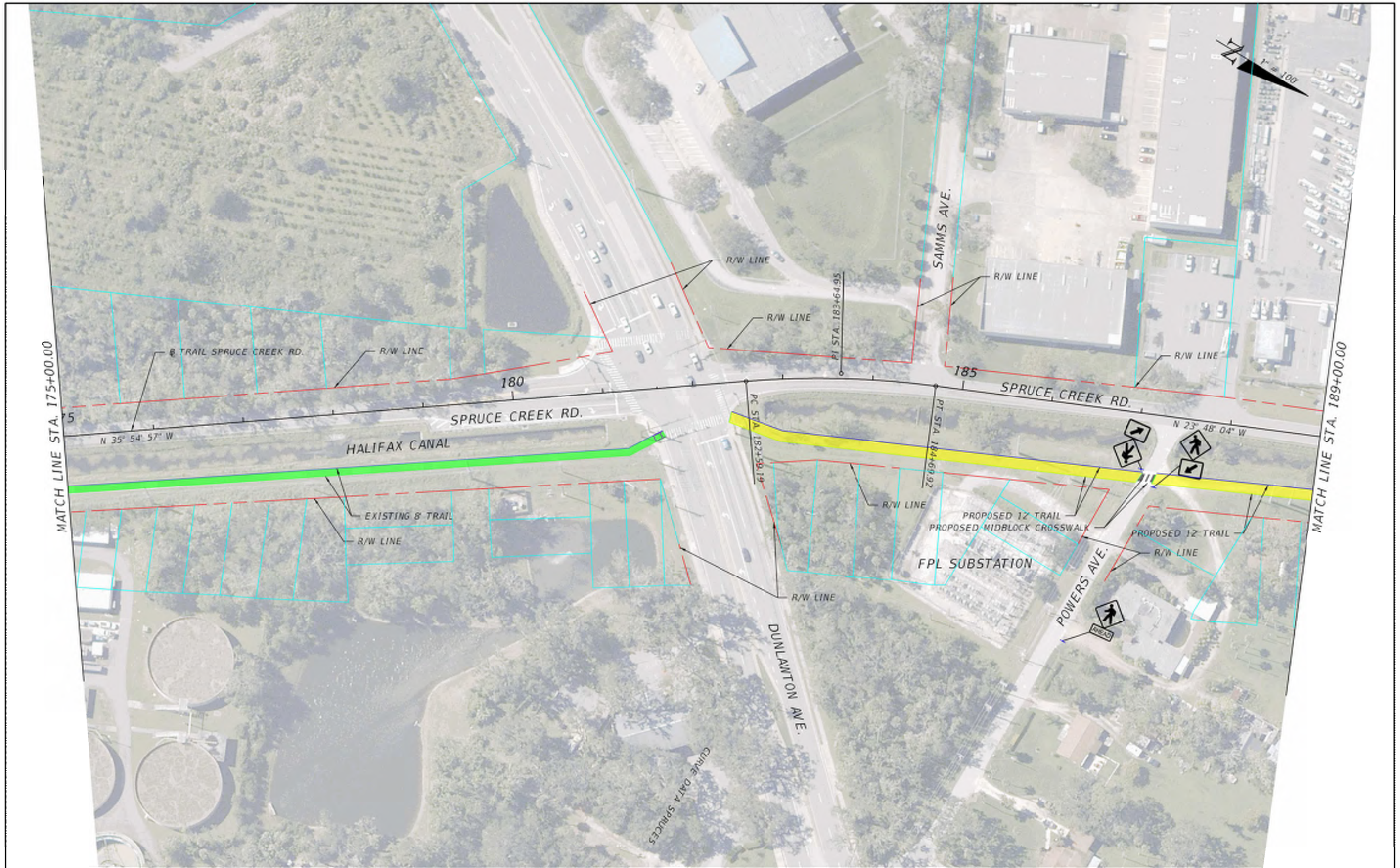
- p. Portable Traffic Monitoring Site (PTMS) or a Telemetry Traffic Monitoring Site (TTMS) may exist within the vicinity of your proposed work. It is the responsibility of the Recipient to locate and avoid damage to these sites. If a PTMS or TTMS is encountered during construction, the Department must be contacted immediately.
- q. During construction, highest priority must be given to pedestrian safety. If permission is granted to temporarily close a sidewalk, it should be done with the express condition that an alternate route will be provided, and shall continuously maintain pedestrian features to meet Americans Disability Act (ADA) standards.
- r. Restricted hours of operation will be from TO BE DETERMINED PRIOR TO CONSTRUCTION, (DAYS OF THE WEEK FOR RESTRICTED OPERATION TO BE DETERMINED), unless otherwise approved by the Operations Engineer, or designee.
- s. Lane closures on the state road system must be coordinated with the Public Information Office at least two weeks prior to the closure. The contact information for the Department's Public Information Office is:

D5-PIO@dot.state.fl.us

Note: (Highlighted sections indicate need to confirm information with District Office or appropriate DOT person managing the Agreement)



LEGEND:			PROPOSED TRAIL		GUARDRAIL	 4152 W. BLUE HERON BOULEVARD, SUITE 119 RIVIERA BEACH, FL 33404 PH: (561) 429-5065	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			<i>CONCEPT PLAN</i>	SHEET NO.
	PROPOSED R/W		PROPERTY LINE		SHARROW		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		48
	EXISTING R/W		EXISTING TRAIL (TO REMAIN)		PROPOSED BOARDWALK	-	VOLUSIA	439865-1-22-01			
	TRAFFIC SIGNAL		PROPOSED TRAIL (PREVIOUS CONTRACT)								

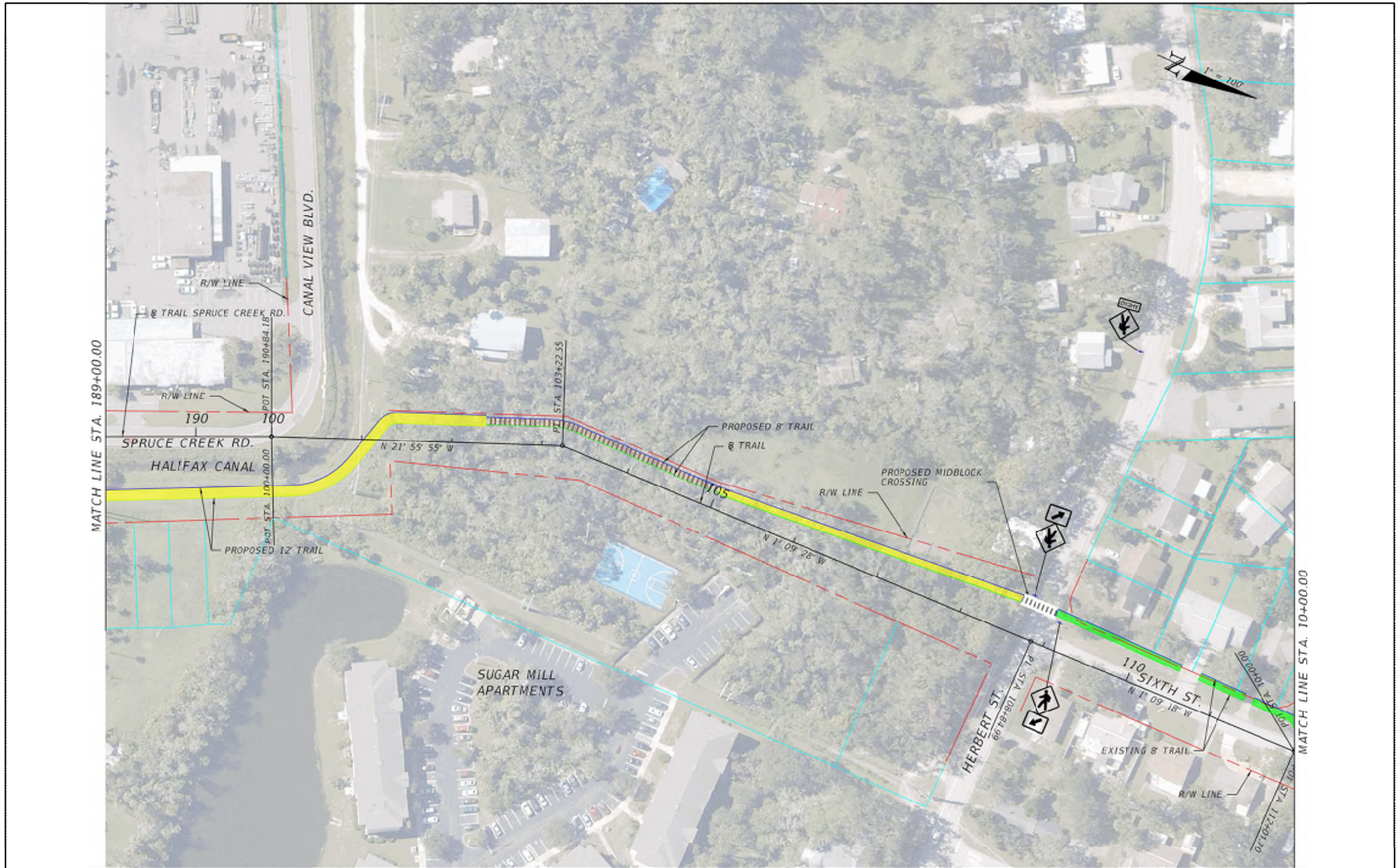


LEGEND:			PROPOSED TRAIL		GUARDRAIL	 4152 W. BLUE HERON BOULEVARD, SUITE 119 RIVIERA BEACH, FL 33404 PH: (561) 429-5065	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			<i>CONCEPT PLAN</i>	SHEET NO.
	PROPOSED R/W		PROPERTY LINE		SHARROW		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		49
	EXISTING R/W		EXISTING TRAIL (TO REMAIN)		PROPOSED BOARDWALK		-	VOLUSIA	439865-1-22-01		
	TRAFFIC SIGNAL		PROPOSED TRAIL (PREVIOUS CONTRACT)			P:\2017\SP17D5001 - St Johns River to Sea Loop Trail PD&E Study\4398651220\roadway\PLANRD048.dgn					
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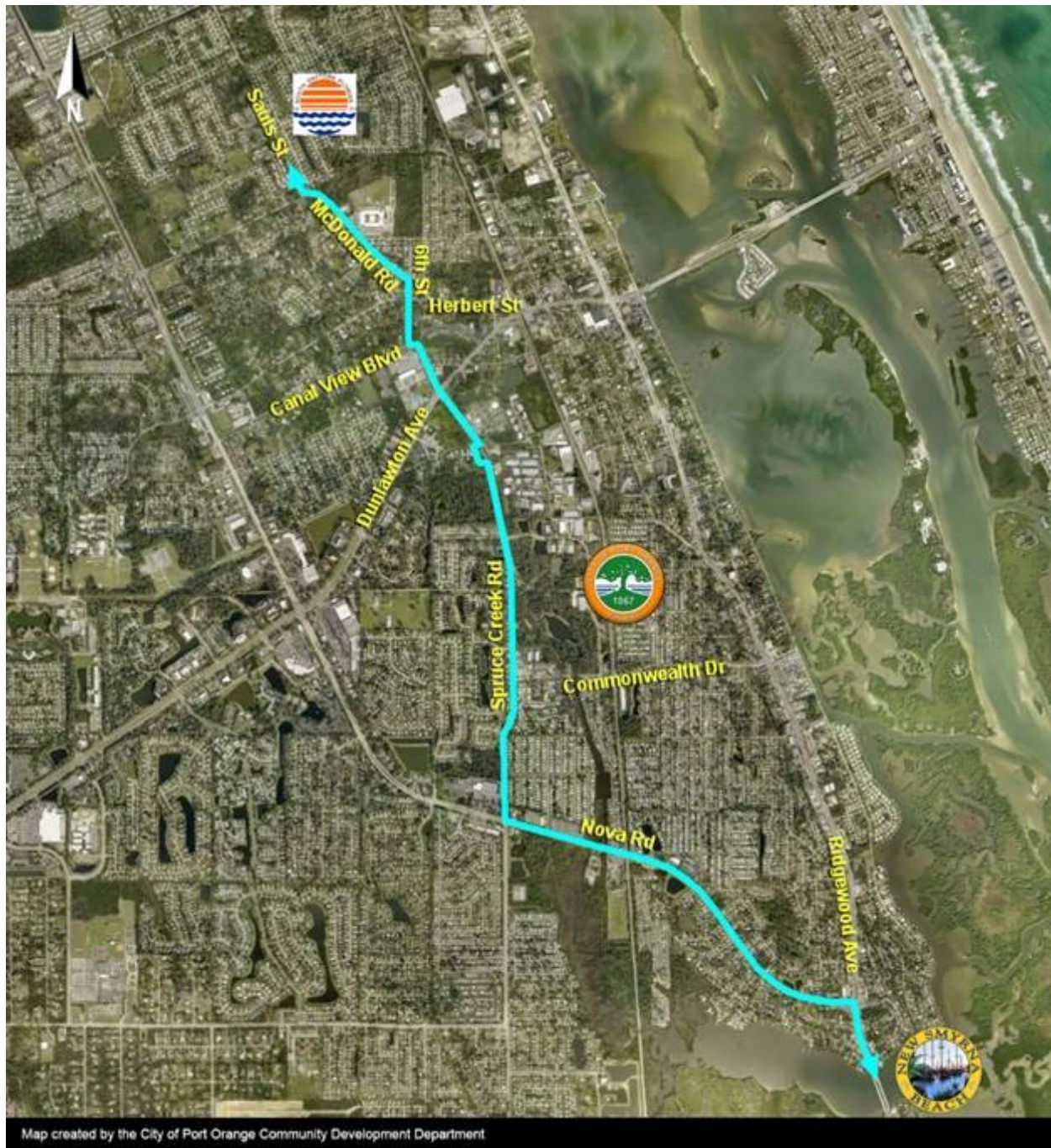
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 PROPOSED R/W	 PROPERTY LINE	 EXISTING TRAIL (TO REMAIN)	 SHARROW		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		50
 EXISTING R/W	 PROPOSED TRAIL (PREVIOUS CONTRACT)		 PROPOSED BOARDWALK		-	VOLUSIA	439865-1-22-01		
 TRAFFIC SIGNAL									
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Exhibit A







CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 5/18/2021

Consent item: Yes

SUBJECT: (C13) Resolution No. 21-25 - Interlocal Agreement for Distribution of the Local Option Fuel Tax

DEPARTMENT: City Manager

GOAL: 2 - Infrastructure 5 - Fiscal Sustainability

RECOMMENDED MOTION:

Move to approve Resolution No. 21-25 - Interlocal Agreement for Distribution of Local Option Fuel Tax

SUMMARY: Florida Statute 336.025 provides local governments the authority to impose and distribute the 6-Cent and 5-Cent Local Option Fuel Taxes for every gallon of motor fuel sold within the county. The County of Volusia and its cities approved an interlocal agreement in 2003 that provided the distribution formula, and has since been renewed. The current agreement expires August 31, 2021.

The expiring distribution formula has not changed since 2003. The formula is as follows:
From the first \$22,170,519.32 distributed:

Volusia County	57.239%
Daytona Beach	7.708%
Daytona Beach Shores	1.228%
DeBary	2.038%
DeLand	2.350%
Deltona	9.428%
Edgewater	1.847%
Holly Hill	1.247%
Lake Helen	0.253%

New Smyrna Beach	3.320%
Oak Hill	0.152%
Orange City	0.840%
Ormond Beach	5.087%
Pierson	0.210%
Ponce Inlet	0.653%
Port Orange	5.017%
South Daytona	1.383%
Municipal Total	42.761%
Total	100.000%

If the annual collection exceeds \$22,170,519.32, the distribution is as follows:
The County receives 57.239%. The cities split the remaining 42.761% based on their percentage of taxable value, population, and road miles.

Port Orange signed the most recent extension, but in some prior years did not approve the old formula. Based on state law, if the population in the cities that sign the interlocal includes a majority of the County residents, then the interlocal goes into effect anyway and the dissenting cities participate by default. Port Orange will be critical in the approval of the new formula.

If a majority of the participating cities and County cannot agree on a formula, the distribution reverts to the standard state formula as defined in FS336.025, which states that the proceeds of the tax would be distributed among the county government and eligible municipalities based on the transportation expenditures of each for the immediately preceding 5 fiscal years, as a proportion of the total of such expenditures for the county and all municipalities within the county, or another method determined by the County that is consistent with law.

For approximately the last two years, staff from Volusia County and all participating cities have been discussing the expiring agreement to negotiate a new formula. Over twenty scenarios were evaluated. The prior City Manager and Assistant City Manager were integral in the development and evaluation of the proposed formula. The various scenarios evaluated factors to include lane miles, center lane miles, population, adjustment to County portion, actual transportation expenditures, and taxable values.

The new formula maintains the 57.239% to the County and 42.761% to the Cities. The annual allocation to participating municipalities will be based on lane miles of public

roads maintained by each municipality. The implementation of this new formula would be phased in over a 5 year period in order to assist those municipalities seeing a decrease to be able to incrementally adjust to the revenue reduction. Over the 5 year period, the City of Port Orange's calculation is estimated to change from 5.017% to 4.940%, with an estimated decrease of approximately \$3,500 in revenue each year based on the change in the formula. Other factors may impact this revenue source to include the building of new roads and a change in the utilization of fuel. Overall, the formula was agreed to by most parties involved to be a more equitable and appropriate distribution over the previous formula.

Staff recommends the proposed Interlocal Agreement.

Project No.: N/A

Funding Account No.: 000000000000

Presenter: Jamie Miller

ATTACHMENTS:

1.	Resolution No. 21-25	Resolution 21-25 Approving ILA re fuel tax.pdf
2.	5 Yr Revenue Allocation - Scenario 21a Final Ver Lane Mile	5 Yr Revenue Allocation - Scenario 21a Final Ver Lane Mile.pdf
3.	Expiring Local Option Gas Tax Interlocal Agreement	Expiring Local Option Gas Tax Interlocal Agreement.pdf
4.	2003 Interlocal Agreement	2003 ILA Fuel - executed.pdf

Jamie Miller
Wayne Clark
Lupe Reyna-Coffin
Scott Neils
Matthew Jones
Wayne Clark
Robin Fenwick

Created/Initiated - 5/2/2021
Approved - 5/2/2021
Approved - 5/3/2021
Approved - 5/4/2021
Approved - 5/5/2021
Approved - 5/9/2021
Final Approval - 5/10/2021

RESOLUTION NO. 21-25

A RESOLUTION OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA, APPROVING THE RENEWAL OF THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX FROM SEPTEMBER 1, 2021 THROUGH AUGUST 31, 2034; AUTHORIZING THE MAYOR AND CITY MANAGER TO EXECUTE THE AGREEMENT; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, Section 336.025, Florida Statutes, provides for the distribution of the Local Option Fuel Taxes pursuant to interlocal agreement between the County of Volusia and municipalities within the County; and

WHEREAS, the existing Interlocal Agreement governing the distribution of the Local Option Fuel Taxes is set to expire on midnight, August 31, 2021; and

WHEREAS, the parties desire to renew the Interlocal Agreement which contains a new 5-year phased-in distribution formula for the proceeds of the 6-Cent and 5-Cent Local Option Fuel Taxes; and

WHEREAS, City Council deems it in the best interest of the residents of the City of Port Orange to enter into said agreement.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA:

Section 1. The Renewal of the Interlocal Agreement for Distribution of Proceeds of Local Option Fuel Tax, a copy of which is attached hereto as Exhibit "A," is hereby approved.

Section 2. The Mayor and City Manager are hereby authorized to execute the agreement.

Section 3. The agreement shall become effective when it is executed by the County of Volusia and by participating municipalities representing a majority of the population of the incorporated area of the County.

Section 4. This resolution shall become effective immediately upon adoption.

Mayor Donald O. Burnette

ATTEST:

Robin L. Fenwick, MMC, City Clerk

Adopted on the day of

Reviewed and Approved: _____
Carly R. Meek, Assistant City Attorney

[CA-2003]

EXHIBIT "A"

RENEWAL OF INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX

THIS AGREEMENT between the COUNTY OF VOLUSIA, a political subdivision of the State of Florida (County), and the municipalities by which it is executed, provides for the distribution of the proceeds of the 6-Cent Local Option Fuel Tax imposed by the County of Volusia under the authority of Section 336.025(1)(a), Florida Statutes, as amended, and the Additional 5-Cent Local Option Fuel Tax imposed by the County of Volusia under the authority of Section 336.025(1)(b), Florida Statutes, as amended, and Chapter 114, Articles III and VI, County Code of Ordinances, as follows:

1. In addition to any other taxes allowed by law, the 6-Cent Local Option Fuel Tax and Additional 5-Cent Local Option Fuel Tax upon every gallon of motor fuel sold in Volusia County under the authority of the statutes and ordinances referred to above shall be distributed to the County and participating municipal governments in Volusia County.
2. Fifty-seven and two hundred thirty-nine thousandths percent (57.239%) of the 6-Cent Local Option Fuel Tax and Additional 5-Cent Local Option Fuel Tax levied under the authority of the statutes and the ordinances referred to above shall be distributed to the County.
3. Forty-two and seven hundred sixty-one thousandths percent (42.761%) of the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local option Fuel Tax levied under the authority of the statutes and ordinances referred to above shall be distributed to municipalities within Volusia County. For each calendar year, the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax; hereinafter referred to as "LOFT", shall be distributed among the participating municipalities as follows:

(a) Annual allocation of LOFT accruing to each participating municipality shall be

RENEWAL OF INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX

April 23, 2021

Page 1 of 26

based on the lane miles of public roads maintained by each municipality within their jurisdiction.

- (b) The division of LOFT proceeds shall be based on a formula in which the ratio of lane miles of public roads maintained by all participating municipalities shall be calculated each year. A participating municipality's lane miles shall be divided by the combined total lane miles of the participating municipalities in order to determine the participating municipality's distribution allocation. For the purpose of this agreement, the term "lane miles of public roads maintained" means lane miles of driving surface for the maintenance of which the jurisdiction bear the legal responsibility. State Roads, County maintained roads and other roads such as private roads shall be excluded.
- (c) The lane miles used for this agreement to determine a participating municipality's distribution allocation were supplied to the County by each municipality. The data provided to the County shall serve as the baseline lane miles (Attachment 1) and will be used for future allocation adjustments referenced in paragraph 3(e) below.
- (d) FIVE YEAR AUTOMATIC ANNUAL ADJUSTMENT FOR 2021-2026. The tables below identify the automatic annual adjustments agreed to by the participating municipalities of the annual percentage share for each municipality over the following five year period.

- i. From September 1, 2021 through August 31, 2022, as follows:

Participating Municipality	Share
Daytona Beach	7.475%
Daytona Beach Shores	0.992%
DeBary	2.175%
DeLand	2.519%
Deltona	9.528%
Edgewater	2.058%
Holly Hill	1.236%

Lake Helen	0.331%
New Smyrna Beach	3.319%
Oak Hill	0.228%
Orange City	0.864%
Ormond Beach	4.881%
Pierson	0.254%
Ponce Inlet	0.582%
Port Orange	5.002%
South Daytona	1.318%

ii. From September 1, 2022 through August 31, 2023, as follows:

Participating Municipality	Share
Daytona Beach	7.242%
Daytona Beach Shores	0.756%
DeBary	2.312%
DeLand	2.689%
Deltona	9.628%
Edgewater	2.269%
Holly Hill	1.226%
Lake Helen	0.409%
New Smyrna Beach	3.317%
Oak Hill	0.303%
Orange City	0.887%
Ormond Beach	4.675%
Pierson	0.298%
Ponce Inlet	0.511%
Port Orange	4.986%
South Daytona	1.253%

iii. From September 1, 2023 through August 31, 2024, as follows:

Participating Municipality	Share
Daytona Beach	7.009%
Daytona Beach Shores	0.520%
DeBary	2.449%
DeLand	2.858%
Deltona	9.728%
Edgewater	2.480%
Holly Hill	1.215%
Lake Helen	0.487%
New Smyrna Beach	3.316%
Oak Hill	0.379%
Orange City	0.911%
Ormond Beach	4.469%

RENEWAL OF INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX

April 23, 2021

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Pierson	0.342%
Ponce Inlet	0.440%
Port Orange	4.971%
South Daytona	1.188%

iv. From September 1, 2024 through August 31, 2025, as follows:

Participating Municipality	Share
Daytona Beach	6.776%
Daytona Beach Shores	0.284%
DeBary	2.586%
DeLand	3.028%
Deltona	9.828%
Edgewater	2.691%
Holly Hill	1.204%
Lake Helen	0.566%
New Smyrna Beach	3.314%
Oak Hill	0.455%
Orange City	0.935%
Ormond Beach	4.262%
Pierson	0.386%
Ponce Inlet	0.369%
Port Orange	4.955%
South Daytona	1.122%

v. From September 1, 2025 through August 31, 2026, as follows:

Participating Municipality	Share
Daytona Beach	6.543%
Daytona Beach Shores	0.048%
DeBary	2.723%
DeLand	3.197%
Deltona	9.928%
Edgewater	2.902%
Holly Hill	1.194%
Lake Helen	0.644%
New Smyrna Beach	3.313%
Oak Hill	0.530%
Orange City	0.959%
Ormond Beach	4.056%
Pierson	0.430%
Ponce Inlet	0.298%
Port Orange	4.940%
South Daytona	1.057%

(e) ANNUAL ADJUSTMENT ALLOCATION AFTER AUGUST 31, 2026. After the

five year phase in of the automatic annual adjustment redistribution allocations described in paragraphs 3(d)i through 3(d)v above, the distribution proportion proceeds of the participating municipalities shall be automatically adjusted annually based on the ratio of lane miles of public roads maintained by all participating municipalities. The participating municipalities shall inform the County, prior to January 1 of each year, of any lane miles added to or removed from its inventory either through acceptance of public road from development, through construction of new roads, through transfers from one jurisdiction to another, or through any other means, in order that the County may determine the revisions to the distribution formula caused by the additions or deletions of lane miles. Prior to May 1 of each year, the County shall recalculate the distribution ratios based upon the updated lane miles maintained provided by the participating municipalities and advise the Florida Department of Revenue and the participating municipalities of the revised percentages the participating municipalities will receive in the next calendar year.

4. Only those municipalities eligible for participation in the distribution of moneys under Parts II and VI of Chapter 218, Florida Statutes, are eligible to receive any portion of the proceeds of the 6-Cent Local Option Fuel Tax and Additional 5-Cent Local Option Fuel Tax imposed by the County. Any funds otherwise undistributed because of ineligibility shall be distributed to eligible governments within the County in the same proportion as the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax funds distributed to eligible governments.
5. The County and participating municipalities shall utilize moneys received from the 6-Cent Local Option Fuel Tax only for transportation expenditures as provided in Section

336.025(1)(a)1, Florida Statutes, or as may hereafter be provided by law.

6. The County and participating municipalities shall use moneys received pursuant to the Additional 5-Cent Local Option Fuel Tax for transportation expenditures needed to meet the requirements of the capital improvements element of an adopted comprehensive plan or for expenditures needed to meet immediate local transportation problems and for other transportation- related expenditures that are critical for building comprehensive roadway networks by local governments as provided in Section 336.025(1)(b)3, Florida Statutes, or as may hereafter be provided by law. For the purposes of this paragraph, expenditures for the construction of new roads, or the reconstruction or resurfacing of existing paved roads or the paving of existing graded roads shall be deemed to increase capacity and such projects shall be included in the capital improvements element of an adopted comprehensive plan. Expenditures of the Additional 5-Cent Local Option Fuel Tax shall not include routine maintenance of roads. Routine maintenance means minor repairs and associated tasks necessary to maintain a safe and efficient transportation system. The term routine maintenance includes: pavement patching; shoulder repair, cleaning and repair of drainage ditches, traffic signs, and structures; mowing; bridge inspection and maintenance; pavement striping; litter clean up; and other similar activities.
7. For the purposes of this agreement, “transportation expenditures” means expenditures by the local government from local or state shared revenue sources, excluding expenditures of bond proceeds, for the following programs:
 - (a) Public transportation operations and maintenance;
 - (b) Roadway and right-of-way maintenance and equipment and structures used primarily for the storage and maintenance of such equipment;
 - (c) Roadway and right-of-way drainage;
 - (d) Street lighting installation, operation, maintenance, and repair;

- (e) Traffic signs, traffic engineering, signalization, and pavement markings, installation, operation, maintenance, and repair;
 - (f) Bridge maintenance and operation; and
 - (g) Debt service and current expenditures for transportation capital projects in the foregoing program areas, including construction or reconstruction of roads and sidewalks.
- 8. The County and participating municipalities shall separately budget and account for the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax in order to segregate expenditures of each tax for compliance with the limitations on expenditures contained in this agreement. In the alternative, the County or a participating municipality may budget and account for the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax in combination so long as each and every expenditure of either Local Option Fuel Tax is limited to the uses proscribed for the Additional 5-Cent Local Option Fuel Tax as set forth in Section 336.025(1)(b)3, Florida Statutes, or whatever is the most restrictive use of any Local Option Fuel Tax moneys as may be hereafter proscribed by law.
- 9. This agreement shall apply to the proceeds of the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax levied on motor fuels sold between 12:01 a.m., September 1, 2021, and midnight, August 31, 2034, whether or not those proceeds are actually collected or received within that period.
- 10. This agreement shall become effective if, prior to August 31, 2021, it shall have been executed by the County and by participating municipalities representing a majority of the population of the incorporated area of the County. It may be executed by signature on a separate sheet attaching a copy of the agreement. The original agreement with all original signature pages shall be maintained on file in the Office of the County Manager. If it shall

RENEWAL OF INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX

April 23, 2021

Page 7 of 26

not be executed by the County and by the requisite number of participating municipalities prior to the date set forth above, it shall be of no effect, and any local option fuel tax imposed under this statute referred to above shall be divided as otherwise provided by law.

IN WITNESS WHEREOF, the parties hereto have caused the execution hereof by their duly authorized officials on the dates indicated below.

ATTEST:

COUNTY OF VOLUSIA, a political
subdivision of the State of Florida

George Recktenwald
County Manager

BY: _____
Jeffery S Brower
County Chair

DATE: _____

ATTEST:

CITY OF DAYTONA BEACH, a Florida
municipal corporation

JAMES V. CHISHOLM
City Manager

BY: _____

DERRICK L. HENRY
Mayor

LETITIA LAMAGNA
City Clerk

DATE: _____

RENEWAL OF INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX

April 23, 2021

Page 10 of 26

ATTEST:

**CITY OF DAYTONA BEACH SHORES, a
Florida municipal corporation**

MICHAEL T. BOOKER
City Manager

BY:

NANCY MILLER
Mayor

CHERI SCHWAB
City Clerk

DATE: _____

RENEWAL OF INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX

April 23, 2021

Page 11 of 26

ATTEST:

CITY OF DEBARY, a Florida
municipal corporation

CARMEN ROSAMONDA
City Manager

BY:

KAREN CHASEZ
Mayor

ANNETTE HATCH
City Clerk

DATE: _____

RENEWAL OF INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX

April 23, 2021

Page 12 of 26

ATTEST:

CITY OF DELAND, a Florida
municipal corporation

MICHAEL PLEUS
City Manager

BY:

ROBERT F. APGAR
Mayor

JULIE HENNESSY
City Clerk

DATE: _____

ATTEST:

CITY OF DELTONA, a Florida
municipal corporation

JOHN A. PETERS
Interim City Manager

BY: _____
HEIDI K. HERZBERG
Mayor

JOYCE RAFTERY
City Clerk

DATE: _____

ATTEST:

CITY OF EDGEWATER, a Florida
municipal corporation

GLENN A. IRBY
City Manager

BY:

MICHAEL THOMAS
Mayor

BONNIE BROWN
City Clerk

DATE: _____

ATTEST:

CITY OF HOLLY HILL, a Florida municipal
corporation

JOE FORTE
City Manager

BY:

CHRIS VIA
Mayor

VALERIE MANNING
City Clerk

DATE: _____

RENEWAL OF INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX

April 23, 2021

Page 16 of 26

ATTEST:

CITY OF LAKE HELEN, a Florida
municipal corporation

LEE EVETT
Interim City Administrator

BY: _____
DAISY RAISLER
Mayor

LAUREN OLSEN
City Clerk

DATE: _____

ATTEST:

CITY OF NEW SMYRNA BEACH, a Florida
municipal corporation

KHALID RESHEIDAT
City Manager

BY: _____

RUSS OWEN
Mayor

KELLY McQUILLEN
City Clerk

DATE: _____

ATTEST:

CITY OF OAK HILL, a Florida municipal
corporation

KOHN EVANS
City Administrator / City Clerk

BY: _____
DOUGLAS A. GIBSON
Mayor

Witness

DATE: _____

ATTEST:

CITY OF ORANGE CITY, a Florida municipal corporation

DALE ARRINGTON
City Manager

BY: _____
GARY BLAIR
Mayor

MELANI BERINGER, CMC
City Clerk

DATE: _____

ATTEST:

CITY OF ORMOND BEACH, a Florida
municipal corporation

JOYCE SHANAHAN
City Manager

BY: _____

BILL PARTINGTON
Mayor

COLBY J. CILENTO
City Clerk

DATE: _____

RENEWAL OF INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX

April 23, 2021

Page 21 of 26

ATTEST:

TOWN OF PIERSON, a Florida
municipal corporation

CARMEN M. SPELORZI
Town Administrator / Town Clerk

BY: _____
SAMUEL G. S. BENNETT
Mayor

Witness

DATE: _____

ATTEST:

TOWN OF PONCE INLET, a Florida
municipal corporation

JEANEEN C. WITT
Town Manager

BY: _____

GARY L. SMITH
Mayor

KIM CHERBANO
Deputy Clerk

DATE: _____

RENEWAL OF INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS OF LOCAL OPTION FUEL TAX

April 23, 2021

Page 23 of 26

ATTEST:

CITY OF PORT ORANGE, a Florida
municipal corporation

WAYNE CLARK
City Manager

BY:

DONALD O. BURNETTE
Mayor

ROBIN FENWICK
City Clerk

DATE: _____

ATTEST:

CITY OF SOUTH DAYTONA, a Florida
municipal corporation

LES GILLIS
City Manager

BY: _____
WILLIAM C. HALL
Mayor

DEBBIE FITZGERALD
City Clerk

DATE: _____

2021 Baseline Lane Miles - Municipalities		
Jurisdiction	Lane Miles	Percent of Lane Miles
Daytona Beach	579.12	15.300%
Daytona Beach Shores	4.21	0.111%
DeBary	241.01	6.368%
DeLand	283.01	7.477%
Deltona	878.80	23.218%
Edgewater	256.85	6.786%
Holly Hill	105.66	2.792%
Lake Helen	56.97	1.505%
New Smyrna Beach	293.25	7.748%
Oak Hill	46.95	1.240%
Orange City	84.85	2.242%
Ormond Beach	359.04	9.486%
Pierson	38.08	1.006%
Ponce Inlet	26.37	0.697%
Port Orange	437.23	11.552%
South Daytona	93.57	2.472%
Total	3,784.97	100.00%

Scenario 21a: 5 Year Phase-In of Current City/County Split, Then 100% based on Lane Miles for Cities
(Assumes New Revenue will be at or below \$22,170,519)

Total Est Revenue	County's %	County's Amount	Cities %	Cities Amount
\$ 22,170,519.00	57.239%	\$ 12,690,183.37	42.761%	\$ 9,480,335.63

Jurisdiction	Year 1		Year 2		Year 3		Year 4		Year 5	
Daytona Beach	7.475%	\$ 1,657,229.90	7.242%	\$ 1,605,556.20	7.009%	\$ 1,553,882.50	6.776%	\$ 1,502,208.80	6.543%	\$ 1,450,535.10
Daytona Beach Shores	0.992%	\$ 219,911.78	0.756%	\$ 167,569.59	0.520%	\$ 115,227.40	0.284%	\$ 62,885.21	0.048%	\$ 10,543.02
DeBary	2.175%	\$ 482,203.47	2.312%	\$ 512,571.76	2.449%	\$ 542,940.05	2.586%	\$ 573,308.34	2.723%	\$ 603,676.63
DeLand	2.519%	\$ 558,577.73	2.689%	\$ 596,148.25	2.858%	\$ 633,718.78	3.028%	\$ 671,289.31	3.197%	\$ 708,859.84
Deltona	9.528%	\$ 2,112,420.19	9.628%	\$ 2,134,603.84	9.728%	\$ 2,156,787.50	9.828%	\$ 2,178,971.15	9.928%	\$ 2,201,154.81
Edgewater	2.058%	\$ 456,258.93	2.269%	\$ 503,028.37	2.480%	\$ 549,797.82	2.691%	\$ 596,567.26	2.902%	\$ 643,336.71
Holly Hill	1.236%	\$ 274,103.82	1.226%	\$ 271,741.27	1.215%	\$ 269,378.72	1.204%	\$ 267,016.16	1.194%	\$ 264,653.61
Lake Helen	0.331%	\$ 73,414.44	0.409%	\$ 90,737.46	0.487%	\$ 108,060.48	0.566%	\$ 125,383.51	0.644%	\$ 142,706.53
New Smyrna Beach	3.319%	\$ 735,751.13	3.317%	\$ 735,441.03	3.316%	\$ 735,130.93	3.314%	\$ 734,820.83	3.313%	\$ 734,510.73
Oak Hill	0.228%	\$ 50,478.57	0.303%	\$ 67,257.95	0.379%	\$ 84,037.33	0.455%	\$ 100,816.70	0.530%	\$ 117,596.08
Orange City	0.864%	\$ 191,492.21	0.887%	\$ 196,752.07	0.911%	\$ 202,011.93	0.935%	\$ 207,271.78	0.959%	\$ 212,531.64
Ormond Beach	4.881%	\$ 1,082,108.89	4.675%	\$ 1,036,403.47	4.469%	\$ 990,698.05	4.262%	\$ 944,992.64	4.056%	\$ 899,287.22
Pierson	0.254%	\$ 56,320.90	0.298%	\$ 66,083.70	0.342%	\$ 75,846.51	0.386%	\$ 85,609.32	0.430%	\$ 95,372.12
Ponce Inlet	0.582%	\$ 129,030.71	0.511%	\$ 113,287.92	0.440%	\$ 97,545.14	0.369%	\$ 81,802.36	0.298%	\$ 66,059.57
Port Orange	5.002%	\$ 1,108,862.48	4.986%	\$ 1,105,430.02	4.971%	\$ 1,101,997.57	4.955%	\$ 1,098,565.11	4.940%	\$ 1,095,132.65
South Daytona	1.318%	\$ 292,170.49	1.253%	\$ 277,722.71	1.188%	\$ 263,274.93	1.122%	\$ 248,827.15	1.057%	\$ 234,379.36
Total	42.761%	\$ 9,480,335.63	42.761%	\$ 9,480,335.63	42.761%	\$ 9,480,335.63	42.761%	\$ 9,480,335.63	42.761%	\$ 9,480,335.63

**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT
FOR DISTRIBUTION OF PROCEEDS OF LOCAL
OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**

THIS RENEWAL AGREEMENT is entered into between the COUNTY OF VOLUSIA, a political subdivision of the State of Florida, and the municipalities by which it is executed.

WHEREAS, the existing Interlocal Agreement governing the distribution of the local option fuel taxes expires on midnight, August 31, 2019; and

WHEREAS, the parties desire to renew the Interlocal Agreement and its distribution formula for the proceeds of the 6-Cent and 5-Cent Local Option Fuel Taxes for an additional one year.

NOW, THEREFORE, for and in consideration of the premises above, and the mutual covenants contained herein, the parties hereby agree as follows:

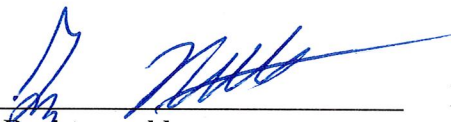
1. The Interlocal Agreement for Distribution of Proceeds of Local Option Fuel Tax executed on September 22, 2003, is hereby renewed for an additional one (1) year, beginning 12:01 a.m., September 1, 2020, and ending midnight, August 31, 2021.
2. All other terms and conditions of the Interlocal Agreement are hereby ratified and continue in full force and effect.
3. This Renewal Agreement shall become effective if it shall have been executed by the County and by participating municipalities representing a majority of the population of the incorporated area of the County by August 31, 2020.
4. This Renewal Agreement may be executed by the parties in counterparts, and each counterpart shall be deemed an original.

**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**

IN WITNESS WHEREOF, the parties hereto have duly executed this Renewal Agreement
on the date set forth below.

ATTEST:

COUNTY OF VOLUSIA, a political subdivision
of the State of Florida

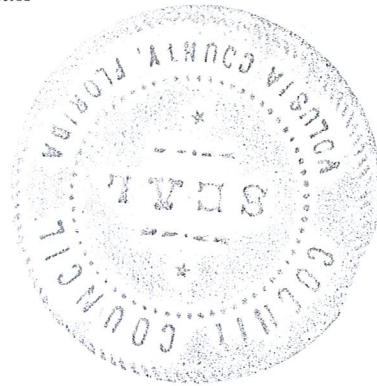


George Reektenwald
County Manager

BY: 

Ed Kelley
County Chair

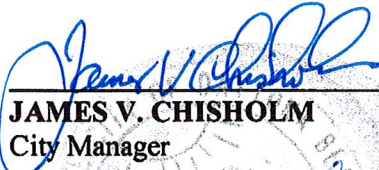
DATE: 8/11/2020



**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**

ATTEST:

CITY OF DAYTONA BEACH, a Florida municipal
corporation



JAMES V. CHISHOLM
City Manager

BY: 

DERRICK L. HENRY
Mayor



LETITIA LAMAGNA
City Clerk

DATE: 8-25-20

**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**

ATTEST:

CITY OF DAYTONA BEACH SHORES,
a Florida municipal corporation



MICHAEL T. BOOKER
City Manager

BY:



NANCY MILLER
Mayor



CHERI SCHWAB
City Clerk

DATE:

8/25/2020

ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021

ATTEST:



CARMEN ROSAMONDA
City Manager

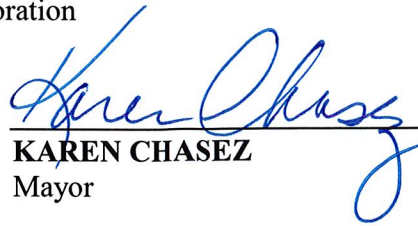

ANNETTE HATCH
City Clerk

DATE:

8/19/2020

CITY OF DEBARY, a Florida municipal
corporation

BY:

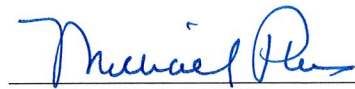


KAREN CHASEZ
Mayor

ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021

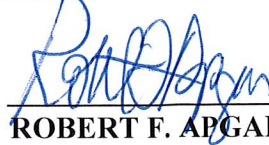
ATTEST:

CITY OF DELAND, a Florida municipal
corporation



MICHAEL PLEUS
City Manager

BY:



ROBERT F. APGAR
Mayor



JULIE HENNESSY
City Clerk

DATE: 8.17.2020

ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021

ATTEST:

CITY OF DELTONA, a Florida municipal
corporation



MARC-ANTONIE COOPER
Interim City Manager

BY: 

HEIDI K. HERZBERG
Mayor



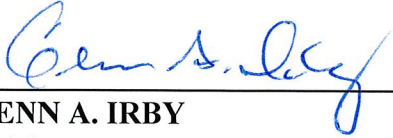
JOYCE RAFTERY
City Clerk

DATE: 8/17/2020

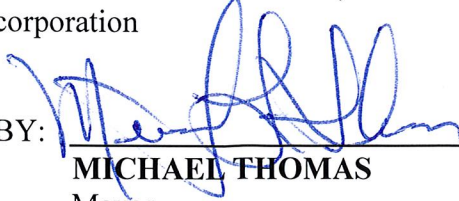
ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021

ATTEST:

CITY OF EDGEWATER, a Florida municipal
corporation



GLENN A. IRBY
City Manager

BY: 

MICHAEL THOMAS
Mayor



ROBIN MATUSICK
City Clerk

DATE: August 3, 2020

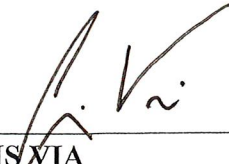
**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**

ATTEST:

CITY OF HOLLY HILL, a Florida municipal
corporation


JOE FORTE
City Manager

BY:


CHRIS VIA
Mayor


VALERIE MANNING
City Clerk

DATE: 8/13/2020

ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021

ATTEST:

CITY OF LAKE HELEN, a Florida municipal
corporation



BECKY WITTE
City Administrator

BY: 

DAISY RAISLER
Mayor



LAUREN OLSEN
City Clerk

DATE: August 13, 2020



ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021

ATTEST:

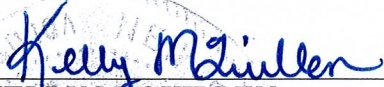


KHALID RESHEIDAT
City Manager

CITY OF NEW SMYRNA BEACH, a Florida
municipal corporation



BY: **RUSS OWEN**
Mayor



KELLY MCQUILLEN
City Clerk

DATE:

August 19, 2020

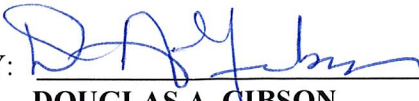
**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**

ATTEST:

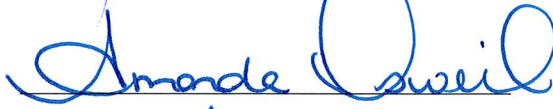
CITY OF OAK HILL, a Florida municipal
corporation



KOHN EVANS
City Administrator / City Clerk

BY: 

DOUGLAS A. GIBSON
Mayor





Witness

DATE: 8-24-2020

**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**

ATTEST:

CITY OF ORANGE CITY, a Florida municipal
corporation



DALE ARRINGTON
City Manager

BY:



GARY BLAIR
Mayor



GLORIA THOMAS
City Clerk

DATE:


August 25, 2020

ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021

ATTEST:

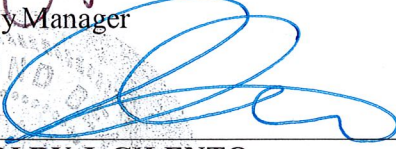
CITY OF ORMOND BEACH, a Florida municipal
corporation



JOYCE SHANAHAN
City Manager

BY: 

BILL PARTINGTON
Mayor

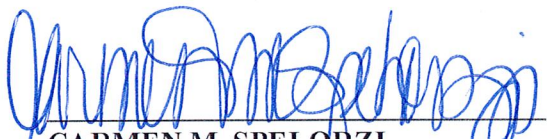


COLBY J. CILETO
City Clerk

DATE: AUGUST 18, 2020

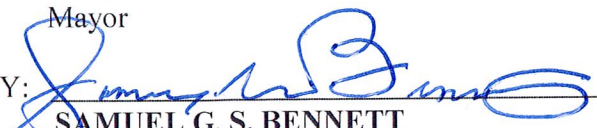
**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**

ATTEST:


CARMEN M. SPELORZI
Town Administrator / Town Clerk

TOWN OF PIERSON, a Florida municipal corporation

BY: _____
VACANT
Mayor

BY: 
SAMUEL G. S. BENNETT
Chairman

Witness

DATE: 7-20-2020



**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**



ATTEST:

Jeaneen Witt
JEANEEN C. WITT

Town Manager

Kim Cherbano
KIM CHERBANO
Deputy Clerk

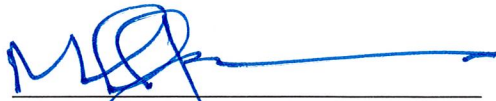
DATE: 8/24/2020

TOWN OF PONCE INLET, a Florida municipal corporation

BY: *Gary L. Smith*
GARY L. SMITH
Mayor

**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**

ATTEST:



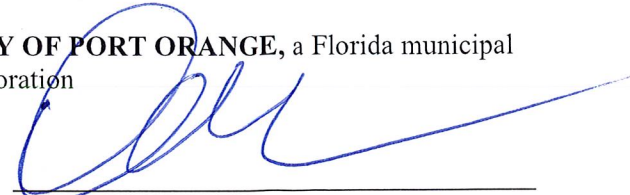
MICHAEL JOHANSSON
City Manager



ROBIN FENWICK
City Clerk

CITY OF PORT ORANGE, a Florida municipal
corporation

BY:

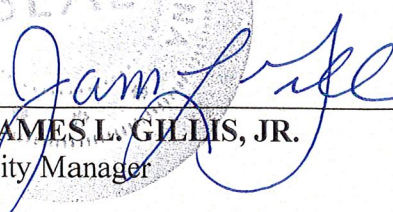


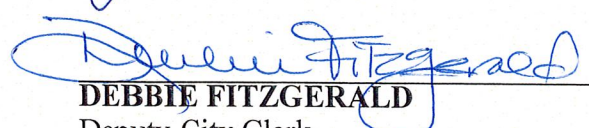
DONALD O. BURNETTE
Mayor

DATE: 8/27/2020

ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021

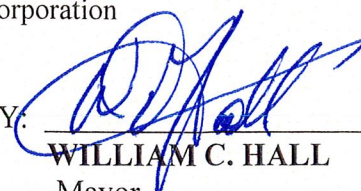
ATTEST:


JAMES L. GILLIS, JR.
City Manager

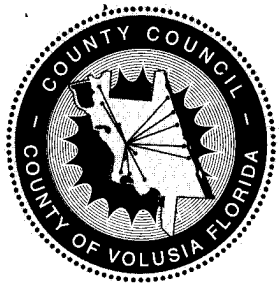

DEBBIE FITZGERALD
Deputy City Clerk

DATE: 08-11-2020

CITY OF SOUTH DAYTONA, a Florida municipal corporation

BY: 
WILLIAM C. HALL
Mayor

**ONE YEAR RENEWAL TO THE INTERLOCAL AGREEMENT FOR DISTRIBUTION OF PROCEEDS
OF LOCAL OPTION FUEL TAX SEPTEMBER 1, 2020 – AUGUST 31, 2021**



County of Volusia

COUNTY MANAGER

123 West Indiana Avenue • DeLand, Florida 32720-4612
(386) 736-5920 • 257-6011 • 423-3860 • Fax: 822-5707
www.volusia.org

FRANK T. BRUNO, JR.
CHAIR
DISTRICT 2

JOSEPH C. JAYNES
VICE-CHAIR
DISTRICT 4

DWIGHT D. LEWIS
DISTRICT 1

JACK H. HAYMAN, SR.
DISTRICT 3

BILL LONG
DISTRICT 5

PATRICIA NORTHEY
AT LARGE

JOIE ALEXANDER
AT LARGE

CYNTHIA A. COTO
COUNTY MANAGER

October 6, 2003

CITY OF PORT ORANGE
RECEIVED

OCT 17 2003

CITY MANAGER

Mr. Kenneth W. Parker
City Manager
City of Port Orange
1000 City Center Circle
Port Orange, FL 32119

Dear Mr. Parker:

Enclosed please find an original executed copy of Interlocal Agreement for the Distribution of Proceeds from the Local Option Fuel Tax proceeds between the County of Volusia and the City of Port Orange.

Also enclosed are fully executed copies of the signature pages for other municipalities.

Sincerely,

Cynthia A. Coto
County Manager

CAC/db

Enc.

INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

THIS AGREEMENT between the COUNTY OF VOLUSIA, a political subdivision of the State of Florida, and the municipalities by which it is executed, provides for the distribution of the proceeds of the 6-Cent Local Option Fuel Tax imposed by the County of Volusia under the authority of Section 336.025(1)(a), Florida Statutes (2003), as amended, and the Additional 5-Cent Local Option Fuel Tax imposed by the County of Volusia under the authority of Section 336.025(1)(b), Florida Statutes (2003), as amended, and Chapter 114, Articles III and VI, County Code of Ordinances, as follows:

1. In addition to any other taxes allowed by law, the 6-Cent Local Option Fuel Tax and Additional 5-Cent Local Option Fuel Tax upon every gallon of motor fuel sold in Volusia County under the authority of the statutes and ordinances referred to above shall be distributed to county and participating municipal governments in Volusia County.
2. Fifty-seven and two hundred thirty-nine thousandths percent (57.239%) of the 6-Cent Local Option Fuel Tax and Additional 5-Cent Local Option Fuel Tax levied under the authority of the statutes and the ordinances referred to above shall be distributed to County of Volusia.
3. Forty-two and seven hundred sixty-one thousandths percent (42.761%) of the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local option Fuel Tax levied under the authority of the statutes and ordinances referred to above shall be distributed to municipalities within Volusia County (hereinafter

"participating municipalities"). For each calendar year, the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax shall be distributed among the participating municipalities as follows:

- (a) From the first \$22,170,519.32 of the 6-Cent Local Option Fuel Tax and Additional 5-Cent Local Option Fuel Tax received by the Florida Department of Revenue collected within Volusia County in each calendar year:
- (1) Seven and seven hundred eight thousandths percent (7.708%) shall be distributed to the City of Daytona Beach.
 - (2) One and two hundred twenty eight thousandths percent (1.228%) shall be distributed to the City of Daytona Beach Shores.
 - (3) Two and thirty eight thousandths percent (2.038%) shall be distributed to the City of DeBary.
 - (4) Two and three hundred fifty thousandths percent (2.350%) shall be distributed to the City of DeLand.
 - (5) Nine and four hundred twenty eight thousandths percent (9.428%) shall be distributed to the City of Deltona.
 - (6) One and eight hundred forty seven thousandths percent (1.847%) shall be distributed to the City of Edgewater.
 - (7) One and two hundred forty seven thousandths percent (1.247%) shall be distributed to the City of Holly Hill.
 - (8) Two hundred fifty three thousandths percent (0.253%) shall be distributed to the City of Lake Helen.

- (9) Three and three hundred twenty thousandths percent (3.320%) shall be distributed to the City of New Smyrna Beach.
- (10) One hundred fifty two thousandths percent (0.152%) shall be distributed to the City of Oak Hill.
- (11) Eight hundred forty thousandths percent (0.840%) shall be distributed to the City of Orange City.
- (12) Five and eighty seven thousandths percent (5.087%) shall be distributed to the City of Ormond Beach.
- (13) Two hundred ten thousandths percent (0.210%) shall be distributed to the Town of Pierson.
- (14) Six hundred fifty three thousandths percent (0.653%) shall be distributed to the Town of Ponce Inlet.
- (15) Five and seventeen thousandths percent (5.017%) shall be distributed to the City of Port Orange.
- (16) One and three hundred eighty three thousandths percent (1.383%) shall be distributed to the City of South Daytona.
- (b) From forty-two and seven hundred sixty-one thousandths percent (42.761%) of the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax received by the Florida Department of Revenue collected within Volusia County in each calendar year in excess of \$22,170,519.32:
 - (1) One third shall be divided among the participating municipalities based on the ratio of each participating municipality's total assessed property value including exempt

and immune properties to the total assessed property value of all participating municipalities. The assessed property value utilized shall be derived from the most recent final tax roll certified by the Volusia County Property Appraiser; and

- (2) One third shall be divided among the participating municipalities based on the ratio of each participating municipality's current population to the total current population of all participating municipalities. The populations utilized shall be as determined by the most recent available report, Florida Estimates of Population, published by the Bureau of Economic and Business Research, University of Florida; and
- (3) One third shall be divided among the participating municipalities based on the ratio of current lane miles of city roads of each participating municipality to the total current lane miles of city roads of all participating municipalities. Lane miles of city roads utilized shall be as determined by the most recent available report of the Florida Department of Transportation, City/County Mileage Report.
- (4) Prior to July 1 each year, the County shall recalculate the ratios in section 3(b) based upon the latest available data and advise the Florida Department of Revenue and the participating municipalities of the revised percentages the participating municipalities will receive in the next calendar year.

4. Only those municipalities eligible for participation in the distribution of moneys under Parts II and VI of Chapter 218, Florida Statutes, are eligible to receive any portion of the proceeds of the 6-Cent Local Option Fuel Tax and Additional 5-Cent Local Option Fuel Tax imposed by the County. Any funds otherwise undistributed because of ineligibility shall be distributed to eligible governments within the County in the same proportion as the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax funds distributed to eligible governments.
5. The County and participating municipalities shall utilize moneys received from the 6-Cent Local Option Fuel Tax only for transportation expenditures as provided in Section 336.025(1)(a)1, Florida Statutes (2003), or as may hereafter be provided by law.
6. The County and participating municipalities shall use moneys received pursuant to the Additional 5-Cent Local Option Fuel Tax for transportation expenditures needed to meet the requirements of the capital improvements element of an adopted comprehensive plan or for expenditures needed to meet immediate local transportation problems and for other transportation-related expenditures that are critical for building comprehensive roadway networks by local governments as provided in Section 336.025(1)(b)3, Florida Statutes (2003), or as may hereafter be provided by law. For the purposes of this paragraph, expenditures for the construction of new roads, or the reconstruction or resurfacing of existing paved roads or the paving of existing graded roads shall be deemed to increase capacity and such projects shall be included in the capital improvements element of an adopted

comprehensive plan. Expenditures of the Additional 5-Cent Local Option Fuel Tax shall not include routine maintenance of roads. Routine maintenance means minor repairs and associated tasks necessary to maintain a safe and efficient transportation system. The term routine maintenance includes: pavement patching; shoulder repair, cleaning and repair of drainage ditches, traffic signs, and structures; mowing; bridge inspection and maintenance; pavement striping; litter clean up; and other similar activities.

7. For the purposes of this agreement, "transportation expenditures" means expenditures by the local government from local or state shared revenue sources, excluding expenditures of bond proceeds, for the following programs:

- (a) Public transportation operations and maintenance;
- (b) Roadway and right-of-way maintenance and equipment and structures used primarily for the storage and maintenance of such equipment;
- (c) Roadway and right-of-way drainage;
- (d) Street lighting;
- (e) Traffic signs, traffic engineering, signalization, and pavement markings;
- (f) Bridge maintenance and operation; and
- (g) Debt service and current expenditures for transportation capital projects in the foregoing program areas, including construction or reconstruction of roads and sidewalks.

8. The County and participating municipalities shall separately budget and account for the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax in order to segregate expenditures of each tax for compliance with the limitations on expenditures contained in this agreement.
In the alternative, the County or a participating municipality may budget and account for the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax in combination so long as each and every expenditure of either Local Option Fuel Tax is limited to the uses proscribed for the Additional 5-Cent Local Option Fuel Tax as set forth in Section 336.025(1)(b)3, Florida Statutes (2003), or whatever is the most restrictive use of any Local Option Fuel Tax moneys as may be hereafter proscribed by law.
9. This agreement shall apply to the proceeds of the 6-Cent Local Option Fuel Tax and the Additional 5-Cent Local Option Fuel Tax levied on motor fuels sold between 12:01 a.m., September 1, 2003, and midnight, August 31, 2013, whether or not those proceeds are actually collected or received within that period.
10. This agreement shall become effective if, prior to August 15, 2003, it shall have been executed by the County and by participating municipalities representing a majority of the population of the incorporated area of the County. It may be executed by signature on a separate sheet attaching a copy of the agreement. The original agreement with all original signature pages shall be maintained on file in the Office of the County Manager. If it shall not be executed by the County and by the requisite number of

participating municipalities prior to the date set forth above, it shall be of no effect, and any local option fuel tax imposed under this statute referred to above shall be divided as otherwise provided by law.

IN WITNESS WHEREOF, the parties hereto have caused the execution hereof by their duly authorized officials on the dates indicated below.

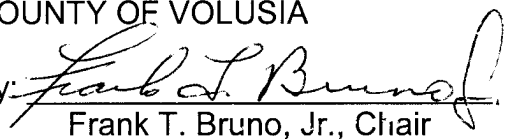
INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest:


Cynthia A. Goto
County Manager

COUNTY COUNCIL
COUNTY OF VOLUSIA

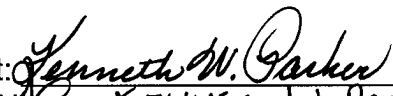
By:


Frank T. Bruno, Jr., Chair

Date:

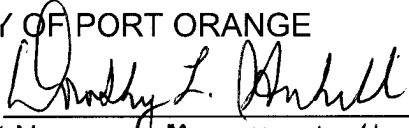
9/22/03

Attest:


Print Name: KENNETH W. PARKER

CITY OF PORT ORANGE

By:


Print Name: ANTHONY L. NUKILL
mayor

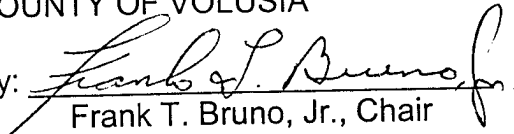
Date:

8/5/2003

INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest: 
Cynthia A. Coto
County Manager

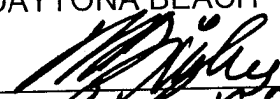
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 9-22-03

Attest: 
Print Name: Jennifer L. Thomas

CITY OF DAYTONA BEACH

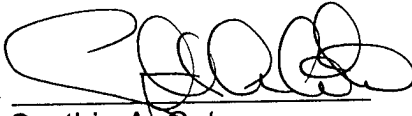
By: 
Print Name: Richard F. Dugley

Date: 8-8-03

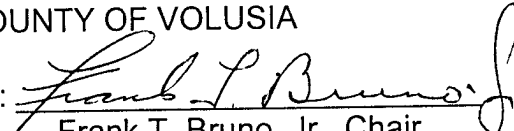
APPROVED:


CITY ATTORNEY

INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest: 
Cynthia A. Coto
County Manager

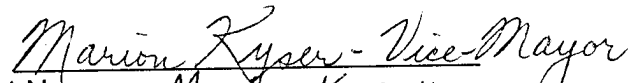
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 9-22-23

Attest: 
Print Name: Cheri Schwab

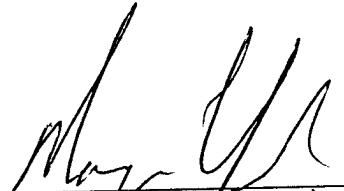
CITY OF DAYTONA BEACH SHORES

By: 
Print Name: Marion Kyser

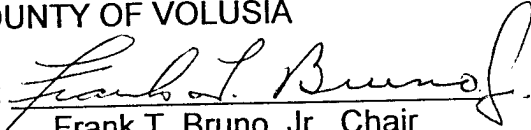
Date: 8/27/03

INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest: 
Cynthia A. Coto
County Manager

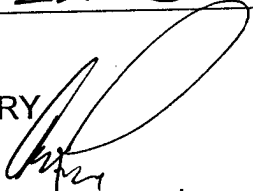
Attest: 
Print Name: MAXINE YASKAWICH
Date: 8/7/03

COUNTY COUNCIL
COUNTY OF VOLUSIA

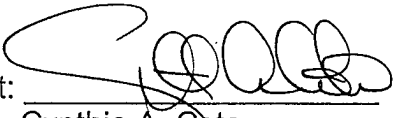
By: 
Frank T. Bruno, Jr., Chair

Date: 9-22-03

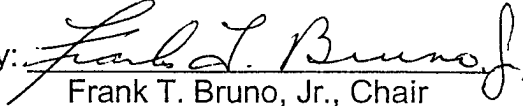
CITY OF DEBARY

By: 
Print Name: CAMMIE ROSAMONDA

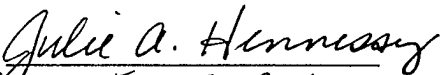
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SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest: 
Cynthia A. Coto
County Manager

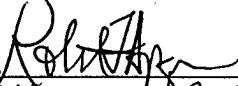
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 9/22/03

Attest: 
Print Name: JULIE A. HENNESSY
CITY CLERK

CITY OF DELAND

By: 
Print Name: ROBERT F. APGAR

Date: 8-4-03

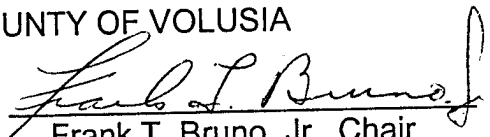
INTERLOCAL AGREEMENT FOR DISTRIBUTION
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SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest:


Cynthia A. Coto
County Manager

COUNTY COUNCIL
COUNTY OF VOLUSIA

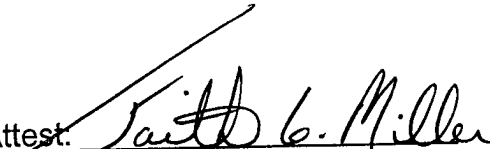
By:


Frank T. Bruno, Jr., Chair

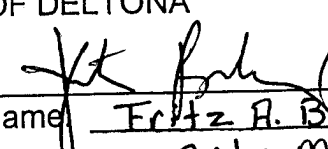
Date:

9-22-03

Attest:


Print Name: Faith G. Miller,
City Clerk

By:


Print Name: Fritz A. Bebring,
City Manager

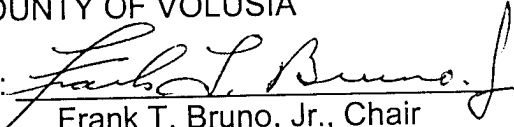
Date:

August 5, 2003

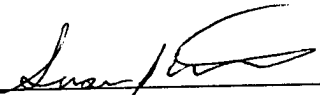
INTERLOCAL AGREEMENT FOR DISTRIBUTION
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SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest: 
Cynthia A. Coto
County Manager

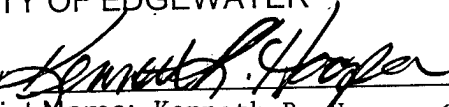
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 9-22-03

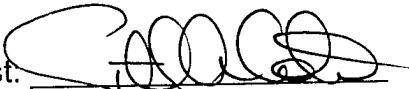
Attest: 
Print Name: Susan J. Wadsworth

CITY OF EDGEWATER

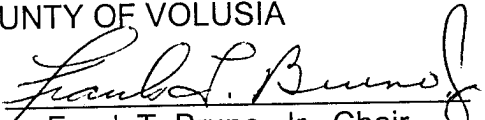
By: 
Print Name: Kenneth R. Hooper-City Manager

Date: August 18, 2003

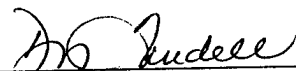
INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest: 
Cynthia A. Coto
County Manager

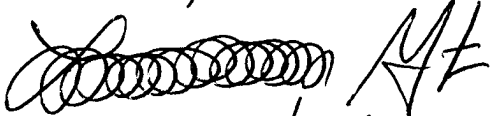
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: September 17, 2003

Attest: 
Print Name: DON FINDELL

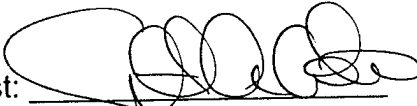
Date: September 4, 2003


LONNIE N. GROOT
CITY ATTORNEY

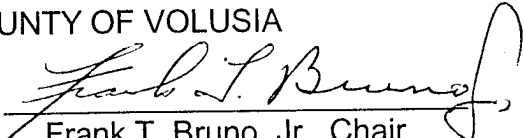
CITY OF LAKE HELEN

By: 
Print Name: Mark Shuttlesworth
Mayor -

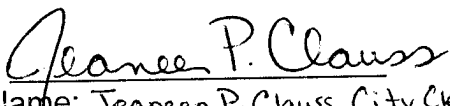
INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest: 
Cynthia A. Coto
County Manager

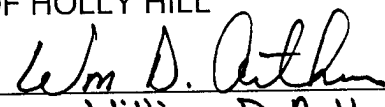
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 9-22-03

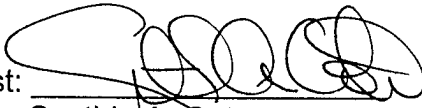
Attest: 
Print Name: Jeanee P. Clauss, City Clerk

CITY OF HOLLY HILL

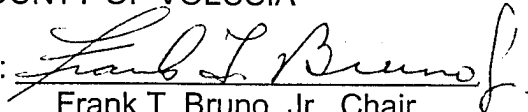
By: 
Print Name: William D. Arthur, Mayor

Date: 8-12-03

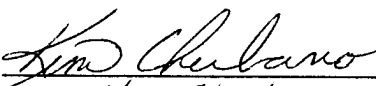
INTERLOCAL AGREEMENT FOR DISTRIBUTION
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SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest: 
Cynthia A. Coto
County Manager

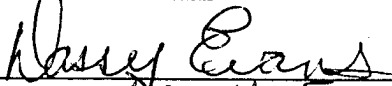
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 9/22/23

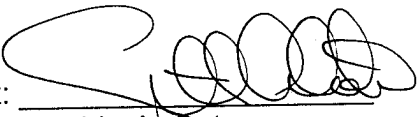
Attest: 
Print Name: Kim Cherbano

CITY OF OAK HILL

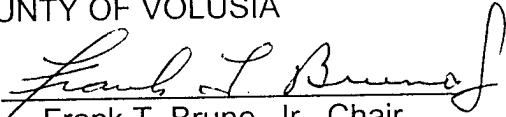
By: 
Print Name: DARRY EVANS

Date: 8-7-03

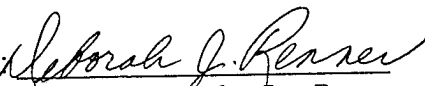
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SEPTEMBER 1, 2003-AUGUST 31, 2013

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Cynthia A. Coto
County Manager

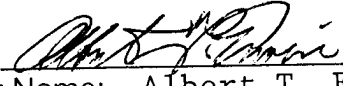
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 9-22-03

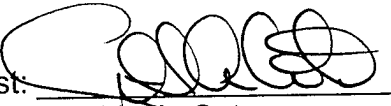
Attest: 
Print Name: Deborah J. Renner

CITY OF ORANGE CITY

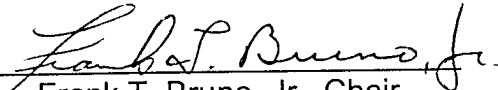
By: 
Print Name: Albert T. Erwin, Mayor

Date: August 13, 2003

INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest: 
Cynthia A. Coto
County Manager

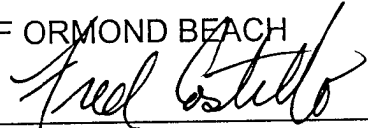
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 9-22-03

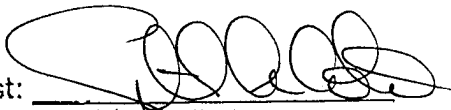
Attest: 
Print Name: Isaac D. Turner
City Manager

CITY OF ORMOND BEACH

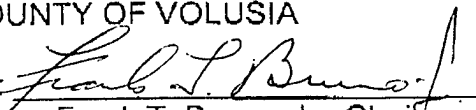
By: 
Print Name: Fred Costello
Mayor

Date: August 19, 2003

INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

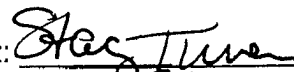
Attest: 
Cynthia A. Coto
County Manager

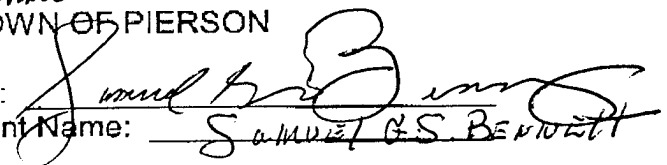
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 7-22-03

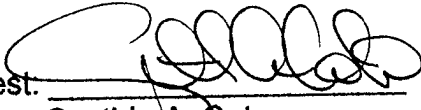
Chair
TOWN OF PIERSON

Attest: 
Print Name: Stacy TURNER

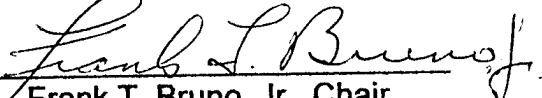
By: 
Print Name: SAMUEL G. S. BENNETT

Date: 8-12-03

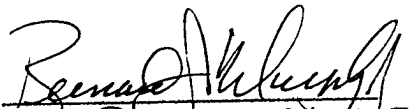
INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

Attest: 
Cynthia A. Coto
County Manager

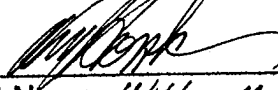
COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 10-9-03

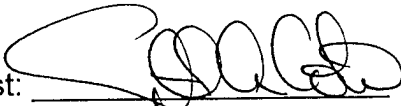
Attest: 
Print Name: Bernard J. Murphy Jr.

TOWN OF PONCE INLET

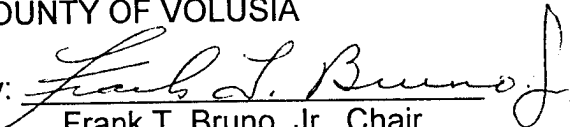
By: 
Print Name: WILLIAM P. HAWK

Date: 8/22/03

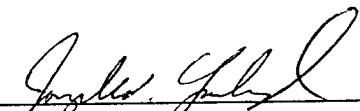
INTERLOCAL AGREEMENT FOR DISTRIBUTION
OF PROCEEDS OF LOCAL OPTION FUEL TAX
SEPTEMBER 1, 2003-AUGUST 31, 2013

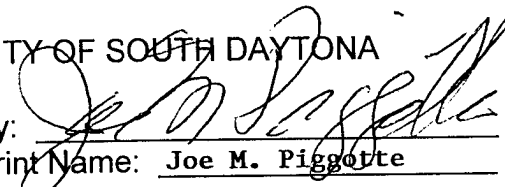
Attest: 
Cynthia A. Coto
County Manager

COUNTY COUNCIL
COUNTY OF VOLUSIA

By: 
Frank T. Bruno, Jr., Chair

Date: 9-22-03

Attest: 
Print Name: Joseph W. Yarbrough

CITY OF SOUTH DAYTONA
By: 
Print Name: Joe M. Piggotte

Date: August 12, 2003



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 5/18/2021

Consent item: Yes

SUBJECT: (C14) Approval of Modification for a Time Extension for the Grant Agreement from Florida Division of Emergency Management for the Virginia Avenue and Monroe Street Drainage and Water Quality Project

DEPARTMENT: Public Utilities

GOAL: 2 - Infrastructure

RECOMMENDED MOTION: Move to approve Modification of the grant agreement between the City of Port Orange and the Florida Division of Emergency Management to be used for the Virginia Monroe Avenue Drainage and Water Quality Project, subject to final review and approval of the grant agreement by the City Attorney.

SUMMARY: The purpose of this item is to approve and execute the modified grant subaward agreement from the Florida Division of Emergency Management for the Virginia Avenue and Monroe Street Drainage and Water Quality Project. This modification extends the period of performance through October 31, 2021 to allow time to complete the project and closeout the award. This modification to the subaward agreement does not impact the scope, award amount or budget. The period of performance extension request was submitted to FDEM prior to the contract expiration date of January 31, 2021. Final approval of the modification was received from FDEM on April 13, 2021.

Project No.: N/A

Funding Account No.: N/A

Presenter: Amanda Lasecki

ATTACHMENTS:

1.	4283-86-R MODIFICATION For Execution 4-13-2021	4283-86-R MOD For Execution 4-13-2021.pdf
2.	Email Approval 4283-86-R, MOD For Execution 4-13-2021	Email Approval 4283-86-R, MOD #1, For Execution 4-13-2021.pdf
3.	Fully Executed Agreement 4283-86-R Virginia Monroe 10.28.18	Fully Executed FEMA HMGP Contract 4283-86-R Virginia Monroe 10.28.18.pdf

Amanda Lasecki
Amanda Lasecki

Created/Initiated - 4/23/2021
Approved - 4/23/2021

Alison Sylvester	Approved - 4/26/2021
Julia Wiggins	Approved - 4/26/2021
Junos Reed	Approved - 4/26/2021
Steve Parnell	Approved - 4/26/2021
Lynn Stevens	Approved - 4/27/2021
Lupe Reyna-Coffin	Approved - 4/28/2021
Scott Neils	Approved - 4/30/2021
Matthew Jones	Approved - 5/6/2021
Wayne Clark	Approved - 5/9/2021
Robin Fenwick	Final Approval - 5/10/2021

SUB-RECIPIENT AGREEMENT CHECKLIST

DIVISION OF EMERGENCY MANAGEMENT MITIGATION BUREAU

REQUEST FOR REVIEW AND APPROVAL	
SUB-RECIPIENT:	City of Port Orange
PROJECT #:	4283-86-R
PROJECT TITLE:	City of Port Orange, Virginia Avenue & Monroe Street, Drainage Project
CONTRACT #:	H0112
MODIFICATION #:	1

SUB-RECIPIENT REPRESENTATIVE (POINT OF CONTACT)	
	Amanda Lasecki, Grants Manager City of Port Orange 1000 City Center Circle Port Orange, Florida 32129

Enclosed is your copy of the proposed contract/modification between **the City of Port Orange** and the Florida Division of Emergency Management (FDEM).

	COMPLETE
☒	This form is required to be included with all Reviews, Approvals, and Submittal
☒	Two (2) Copies printed for Approval or One (1) copy to be electronically signed
☐	Printed Single-sided (<i>If your policy is to copy two-sided please contact me and I will send you two original one-sided copies for signature</i>)
☒	Reviewed and Approved
☒	Signed and Dated by Official Representative (<i>blue ink</i>) or signed electronically
☒	Copy of the organization's resolution or charter that specifically identifies the person or position that is authorized to sign, if not Chairman, Mayor, Chief
☐	Attachment I - Federal Funding Accountability and Transparency Act (FFATA) completed, signed, and dated (☒ N/A for Modifications) May be signed electronically.
☒	Two Signed and dated Originals mailed to FDEM – Tallahassee or One Original signed electronically and emailed to Grants Specialist. Florida Division of Emergency Management Mitigation Bureau – HMGP 2555 Shumard Oak Boulevard Tallahassee, Florida 32399-2100 Attention – Grant Specialist –Veronica S. Ash, FCCM Email: Veronica.ash@em.myflorida.com

If you have any questions regarding this contract, or who is authorized to sign it, please contact your Project Manager at (850) 815-4585 or email me at Velma.noel@em.myflorida.com.

Contract Number: H0112
Project Number: 4283-86-R

**MODIFICATION TO SUBGRANT AGREEMENT BETWEEN
THE DIVISION OF EMERGENCY MANAGEMENT AND
CITY OF PORT ORANGE**

This Modification Number One made and entered into by and between the State of Florida, Division of Emergency Management ("the Division"), and the City of Port Orange ("the Sub-Recipient") to modify Contract Number H0112, dated, October 23, 2018 ("the Agreement").

WHEREAS, the Division and the Sub-Recipient have entered into the Agreement, pursuant to which the Division has provided a subgrant to the Sub-Recipient under the Hazard Mitigation Grant Program of \$644,250.00, in Federal Funds; and

WHEREAS, the Division and the Sub-Recipient desire to modify the Agreement; and

WHEREAS, the Agreement expired on January 31, 2021; and

WHEREAS, the Division and the Sub-Recipient desire to reinstate and extend the terms of the Agreement.

NOW, THEREFORE, in consideration of the mutual promises of the parties contained herein, the parties agree as follows:

1. The Agreement is hereby reinstated and extended as though it had never expired.
2. Paragraph 8 of the Agreement is hereby amended to read as follows:

(8) PERIOD OF AGREEMENT

This Agreement shall begin October 23, 2018 and shall end October 31, 2021, unless terminated earlier in accordance with the provisions of Paragraph (17) of this Agreement.

3. The Budget and Scope of Work, Attachment A to the Agreement, are hereby modified as set forth in 1st Revision Attachment A to this Modification, a copy of which is attached hereto and incorporated herein by reference.
4. All provisions of the Agreement being modified and any attachments in conflict with this Modification shall be and are hereby changed to conform with this Modification, effective on the date of execution of this Modification by both parties.
5. All provisions not in conflict with this Modification remain in full force and effect and are to be performed at the level specified in the Agreement.
6. Quarterly Reports are due to the Division no later than 15 days after the end of each quarter of the program year and shall be sent each quarter until submission of the administrative close-out report. The ending dates for each quarter of the program year are March 31, June 30, September 30 and December 31.

IN WITNESS WHEREOF, the parties hereto have executed this Modification as of the dates set out below.

SUB-RECIPIENT: CITY OF PORT ORANGE

By: _____

Name and Title: Donald O. Burnette, Mayor

Date: _____

Attest: _____

Name and Title: Robin L. Fenwick, MMC, City Clerk

**STATE OF FLORIDA
DIVISION OF EMERGENCY MANAGEMENT**

By: _____

Name and Title: Jared Moskowitz, Director

Date: _____

Attachment A
(1st Revision)
Budget and Scope of Work

STATEMENT OF PURPOSE:

The purpose of this Scope of Work is to improve drainage by installation of a pump station in Port Orange, Volusia County, Florida, funded through the Hazard Mitigation Grant Program (HMGP) **DR-4283-86-R**, as approved by the Florida Division of Emergency Management (Division) and the Federal Emergency Management Agency (FEMA).

The Sub-Recipient, City of Port Orange, agrees to administer and complete the project per sealed engineering designs and construction plans as submitted by the Sub-Recipient and subsequently approved by the Division and FEMA. The Sub-Recipient shall complete the work in accordance with all applicable Federal, State and Local Laws, Regulations and Codes.

PROJECT OVERVIEW:

As a Hazard Mitigation Grant Program project, the Sub-Recipient proposes drainage improvements in the area along South Ridgewood Avenue between the intersections with Meeker Place and Fox Place in Port Orange, Florida 32127.

The HMGP construction scope of work shall include the construction of a pump station, storm water ponds, installation of force main at Monroe Place and Fox Place, inlets and pipes to properly connect the project area to proposed ponds. Construction of the storm water pond and force main in the proposed area would require acquiring land, moving any disturbed utilities and directional drilling along Fox Place. The proposed force main and diesel driven pumps would be raised 1-foot above the Base Flood Elevation (BFE) and be capable of removing floodwaters out of the low-lying area, which is prone to standing water.

The project shall provide protection against a 25-year storm event. Activities shall be completed in strict compliance with Federal, State and Local applicable Rules and Regulations.

Project Location:

The proposed project starts approximately 50-feet west of Grant Street and Virginia Avenue, continues along Grant Street to the east. North side of the project approximately 50-feet north of intersection of Virginia Avenue and Church Street. South side of the project approximately 100-feet south of intersection of Fox Place and Jefferson Avenue. The project ends 100-feet east of intersection of Riverside Drive and Meeker Place. Project Boundary Coordinates: (29.14245535, -80.99239573); (29.14358136, -80.98528882); (29.13402634, -80.98843858); (29.13609736, -80.98159858). Pond A (29.13790999, -80.98521282); Pond B (29.13793748, -80.98557605).

TASKS & DELIVERABLES:

A) Tasks:

- 1) The Sub-Recipient shall procure the services of a qualified and licensed Florida contractor and execute a contract with the selected bidder to complete the scope of work as approved by the Division and FEMA. The Sub-Recipient shall select the qualified, licensed Florida contractor in accordance with the Sub-Recipient's procurement policy as well as all federal and state laws and regulations. All procurement activities shall contain sufficient source documentation and be in accordance with all applicable regulations.

The Sub-Recipient shall be responsible for furnishing or contracting all labor, materials,

equipment, tools, transportation and supervision and for performing all work per sealed engineering designs and construction plans presented to the Division by the Sub-Recipient and subsequently approved by the Division and FEMA.

The Sub-Recipient and contractor shall be responsible for maintaining a safe and secure worksite for the duration of the work. The contractor shall maintain all work staging areas in a neat and presentable condition.

The Sub-Recipient shall ensure that no contractors or subcontractors are debarred or suspended from participating in federally funded projects.

The selected contractor shall have a current and valid occupational license/business tax receipt issued for the type of services being performed.

The Sub-Recipient shall provide documentation demonstrating the results of the procurement process. This shall include a rationale for the method of procurement and selection of contract type, contractor selection and/or rejection and bid tabulation and listing, and the basis of contract price.

The Sub-Recipient shall provide an executed "Debarment, Suspension, Ineligibility, Voluntary Exclusion Form" for each contractor and/or subcontractor performing services under this agreement.

Executed contracts with contractors and/or subcontractors shall be provided to the Division by the Sub-Recipient.

The Sub-Recipient shall provide copies of professional licenses for contractors selected to perform services. The Sub-Recipient shall provide a copy of a current and valid occupational license or business tax receipt issued for the type of services to be performed by the selected contractor.

- 2) The Sub-Recipient shall monitor and manage the installation to improve the drainage and provide flood protection.

The project shall be implemented in accordance with sealed engineering designs and construction plans previously presented to the Division by the Sub-Recipient and subsequently approved by the Division and FEMA. The Sub-Recipient shall ensure that all applicable state, local and federal laws and regulations are followed and documented, as appropriate.

The project consists of the general construction and furnishing of all materials, equipment, labor and fees to minimize recurring flooding and reduce repetitive flood loss to structures and roadways.

The Sub-Recipient shall fully perform the approved project, as described in the submitted documents, in accordance with the approved scope of work, budget line item, allocation of funds and applicable terms and conditions indicated herein. The Sub-Recipient shall not deviate from the approved project terms and conditions.

Construction activities shall be completed by a qualified and licensed Florida contractor. All construction activities shall be monitored by the professional of record. The Sub-Recipient shall complete the project in accordance with all required permits. All work shall be completed in accordance with applicable codes and standards.

Upon completion of the work, the Sub-Recipient shall schedule and participate in a final inspection of the completed project by the local municipal or county official, or other approving official, as applicable. The official shall inspect and certify that all installation was in accordance with the manufacturer's specifications. Any deficiencies found during this final inspection shall be corrected by the Sub-Recipient prior to Sub-Recipient's submittal of the final inspection request to the Division.

Upon completion of Task 2, the Sub-Recipient shall submit the following documents with sufficient supporting documentation and provide a summary of all contract scope of work and scope of work changes, if any. Additional documentation for closeout shall include:

a) Signed and Sealed As-built project plans (drawings) by the Professional of Record, two hard copies and an electronic version (via email or CD).

b) Letter of Completion:

1. Affirming that the project was completed in conformance with the approved project drawings, specifications and scope; and
2. Certifying Compliance with all applicable codes.

c) Archeological Materials – Project affects undisturbed ground – potential for presence of archeological resources. Projects that involve groundbreaking shall need written verification from the Sub-Recipient that no archeological materials were discovered during project construction.

1. A letter stating no archeological materials were discovered during project construction.

d) Permit(s) and verification of compliance:

1. Water Management Districts.
2. United States Army Corps of Engineers (USACE).
3. Department of Environmental Protection (DEP).
4. Department of Transportation (DOT).
5. Local jurisdiction(s).

NOTE: If no permit was needed – a letter stating, “no permit required”.

e) National Pollutant Discharge Elimination System (NPDES) storm water permit – Required for any drainage over one acre. Include

1. Storm Water Pollution Prevention Plan (SWPPP);
2. Notice of Intent (NOI), awarded by the Florida Department of Environmental Protection (FDEP);
3. Notice of Termination (NOT); terminates the NOI (from FDEP);

OR If the area of disturbance was less than one acre, a letter stating the extent of the ground disturbance (by site).

f) Ground Dewatering Activities at the construction site:

1. Provide documentation of coverage under FDEP “Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity”;
2. **OR** Letter stating that “No ground dewatering activities took place at this project’s site”.

g) Proof of compliance with Project Conditions and Requirements contained herein.

3) During the course of this agreement, the Sub-Recipient shall submit requests for reimbursement. Adequate and complete source documentation shall be submitted to support all costs (federal share and local share) related to the project. In some cases, all project activities may not be fully complete prior to requesting reimbursement of costs incurred in completion of this scope of work; however, a partial reimbursement may be requested.

The Sub-Recipient shall submit an Affidavit signed by the Sub-Recipient's project personnel with each reimbursement request attesting to the completion of the work, that disbursements or payments were made in accordance with all agreement and regulatory conditions, and that reimbursement is due and has not been previously requested.

The Sub-Recipient shall maintain accurate time records. The Sub-Recipient shall ensure invoices are accurate and any contracted services were rendered within the terms and timelines of this agreement. All supporting documentation shall agree with the requested billing period. All costs submitted for reimbursement shall contain adequate source documentation which may include but not be limited to: cancelled checks, bank statements, Electronic Funds Transfer, paid bills and invoices, payrolls, time and attendance records, contract and subcontract award documents.

Construction Expense: The Sub-Recipient shall pre-audit bills, invoices, and/or charges submitted by the contractors and subcontractors and pay the contractors and subcontractors for approved bills, invoices, and/or charges. Sub-Recipient shall ensure that all contractor/subcontractor bills, invoices, and/or charges are legitimate and clearly identify the activities being performed and associated costs.

Project Management Expenses: The Sub-Recipient shall pre-audit source documentation such as payroll records, project time sheets, attendance logs, etc. Documentation shall be detailed information describing tasks performed, hours devoted to each task, and the hourly rate charged for each hour including enough information to calculate the hourly rates based on payroll records. Employee benefits shall be clearly shown.

The Division shall review all submitted requests for reimbursement for basic accuracy of information. Further, the Division shall ensure that no unauthorized work was completed prior to the approved project start date by verifying vendor and contractor invoices. The Division shall verify that reported costs were incurred in the performance of eligible work, that the approved work was completed, and that the mitigation measures are in compliance with the approved scope of work prior to processing any requests for reimbursement.

Review and approval of any third-party in-kind services, if applicable, shall be conducted by the Division in coordination with the Sub-Recipient. Quarterly reports shall be submitted by the Sub-Recipient and received by the Division at the times provided in this agreement prior to the processing of any reimbursement.

The Sub-Recipient shall submit to the Division requests for reimbursement of actual construction and managerial costs related to the project as identified in the project application, sealed engineering designs, and construction plans. The requests for reimbursement shall include:

- a) Contractor, subcontractor, and/or vendor invoices which clearly display dates of services performed, description of services performed, location of services performed, cost of services performed, name of service provider and any other pertinent information;
- b) Proof of payment from the Sub-Recipient to the contractor, subcontractor, and/or vendor for invoiced services;
- c) Clear identification of amount of costs being requested for reimbursement as well as costs being applied against the local match amount.

The Sub-Recipient's final request for reimbursement shall include the final construction project cost. Supporting documentation shall show that all contractors and subcontractors have been paid.

B) Deliverables:

Mitigation Activities consist of drainage improvements in Port Orange, Florida; the project includes a pump station and storm water ponds, installation of force main at Monroe Place and Fox Place, inlets and pipes to properly connect the project area to proposed ponds.

The completed project shall provide protection against a 25-year storm event.

Provided the Sub-Recipient performs in accordance with the Scope of Work outlined in this Agreement, the Division shall reimburse the Sub-Recipient based on the percentage of overall project completion.

PROJECT CONDITIONS AND REQUIREMENTS:

C) Engineering:

- 1) The Sub-Recipient shall submit to the Division an official letter stating that the project is 100% complete and ready for the Division's Final Inspection of the project.
- 2) The Sub-Recipient shall submit a signed and sealed final copy of the completed project's As-built drawings and all necessary supporting documentation, and provide a summary of all contract scope of work changes, if any.
- 3) The Sub-Recipient shall provide a copy of the Notice of Commencement, and any local official Inspection Report and/or Final Approval, as applicable.
- 4) The Sub-Recipient shall submit a certified letter of completion from Engineer of Record. The Sub-Recipient's Engineer of Record shall provide a formal certificate or letter affirming that the project has been completed in conformance with the approved project drawings, specifications, scope, and applicable codes.
- 5) All installations shall be done in strict compliance with the Florida Building Code or any local codes and ordinances. All materials shall be certified to exceed the wind and impact standards of the current local codes.
- 6) The Sub-Recipient shall follow all applicable State, Local and Federal Laws, Regulations and requirements, and obtain (before starting project work) and comply with all required permits and approvals. Failure to obtain all appropriate Federal, State, and Local permits and clearances may jeopardize federal funding.

D) Environmental:

- 1) Sub-Recipient shall follow all applicable state, local and federal laws, regulations and requirements, and obtain (before starting project work) and comply with all required permits and approvals. Failure to obtain all appropriate federal, state, and local environmental permits and clearances may jeopardize federal funding. If project work is delayed for a year or more after the date of the categorical exclusion (CATEX), then coordination with and project review by regulatory agencies shall be redone.
- 2) Any change, addition or supplement to the approved Scope of Work that alters the project (including other work not funded by FEMA, but done substantially at the same time), regardless of the budget implications, shall require re-submission of the application to FEMA through the Division for National Environmental Policy Act (NEPA) re-evaluation before starting project work.
- 3) The Sub-Recipient shall monitor ground disturbing activities during construction, and if any potential archeological resources are discovered, shall immediately cease construction in that area and notify the Division and FEMA.

If human remains or intact archaeological deposits are uncovered, work in the vicinity of the discovery shall stop immediately and all reasonable measures to avoid or minimize harm to the finds shall be taken. The Sub-Recipient shall ensure that archaeological discoveries are

secured in place, that access to the sensitive area is restricted, and that all reasonable measures are taken to avoid further disturbance of the discoveries.

The Sub-Recipient's contractor shall provide immediate notice of such discoveries to the Sub-Recipient. The Sub-Recipient shall notify the Florida Division of Historic Resources, the Division's State Environmental Liaison Officer and FEMA within 24 hours of the discovery. Work in the vicinity of the discovery may not resume until FEMA and the Division have completed consultation with SHPO, Tribes, and other consulting parties as necessary.

In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately, and the proper authorities notified in accordance with **Florida Statutes, Section 872.05**.

Any changes to the approved scope of work will require submission to, and evaluation and approval by, the State and FEMA, prior to initiation of any work, for compliance with Section 106.

- 4) Construction vehicles and equipment used for this project shall be maintained in good working order to minimize pollutant emissions.
- 5) The Subgrantee is responsible for coordinating with and obtaining any required Section 404 permit(s) from the United States Army Corps of Engineers (USACE) and 401 permit(s) from the Florida Department of Environmental Protection prior to initiating work. The Subgrantee shall comply with all conditions and pre-construction notification requirements of the required permit(s). All coordination pertaining to these activities and compliance must be documented and maintained in the applicant's permanent files. Failure to comply with these conditions may jeopardize FEMA funding; verification of compliance will be required at project closeout.
- 6) Unusable equipment, debris and material shall be disposed of in an approved manner and location. In the event significant items (or evidence thereof) are discovered during implementation of the project, applicant shall handle, manage, and dispose of petroleum products, hazardous materials and toxic waste in accordance to the requirements and to the satisfaction of the governing local, state and federal agencies.
- 7) A National Pollutant Discharge Elimination System (NPDES) stormwater permit shall be obtained (if area of disturbance shall be greater than one acre). The Sub-Recipient shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). A copy of the Notice of Intent (NOI) submitted to use the State of Florida Generic Permit for stormwater discharge from construction activities; response letter from Florida Department of Environmental Protection (FDEP) if provided; and a copy of the Notice of Termination (NOT) shall be submitted at project closeout.
- 8) For project closeout, the Sub-Recipient shall provide verification of compliance with the St Johns River Water Management District (SJRWMD) General Permit modification for the Environmental Resource General Permit No 147813-1.
- 9) An Environmental Resource Permit shall be obtained prior to any construction activities. Verification of compliance and copies of all permits shall be provided at project closeout.

E) Programmatic:

- 1) A change in the scope of work *must* be approved by the Division and FEMA in advance regardless of the budget implications.
- 2) The Sub-Recipient must notify the Division as soon as significant developments become known, such as delays or adverse conditions that might raise costs or delay completion, or favorable conditions allowing lower costs or earlier completion.

- 3) The Sub-Recipient must “obtain prior written approval for any budget revision which would result in a need for additional funds” [44 CFR 13(c)], from the Division and FEMA.
- 4) Project is approved with the condition that the enclosed list of deliverables shall be submitted, 30 days prior to the Period of Performance date, for review and approval by the Division, for submittal to FEMA for closeout.
- 5) Any extension of the Period of Performance shall be submitted to FEMA 60 days prior to the expiration date. Therefore, any request for a Period of Performance Extension shall be in writing and submitted, along with substantiation of the new expiration date and a new schedule of work, to the Division a minimum of seventy (70) days prior to the expiration date, for Division processing to FEMA.
- 6) The Sub-Recipient must avoid duplication of benefits between the HMGP and any other form of assistance, as required by Section 312 of the Stafford Act, and further clarification in 44 CFR 206.191.
- 7) A copy of the executed subcontract agreement must be forwarded to the Division within 10 days of execution.
- 8) If the Sub-Recipient is not the current title holder of the affected properties, the Sub-Recipient shall provide documentation confirming the property acquisition and easement rights were obtained voluntarily. If condemnation or eminent domain is used to obtain easement rights, FEMA shall not pay for any associated costs or payments to the property owner. Furthermore, FEMA shall not consider it an eligible contribution to the non-Federal cost share requirement and shall not financially participate in that component of a project if land or easements are obtained involuntarily.

This is FEMA project number **4283-86-R**. It is funded under HMGP, FEMA-4283-DR-FL and must adhere to all program guidelines established for the HMGP in accordance with the PAS Operational Agreement for Disaster 4283.

FEMA awarded this project on August 20, 2018; this Agreement was executed on October 23, 2018; and the Period of Performance for this project shall end on **October 31, 2021**.

F) FINANCIAL CONSEQUENCES:

If the Sub-Recipient fails to comply with any term of the award, the Division shall take one or more of the following actions, as appropriate in the circumstances:

- 1) Temporarily withhold cash payments pending correction of the deficiency by the Sub-Recipient;
- 2) Disallow all or part of the cost of the activity or action not in compliance;
- 3) Wholly or partly suspend or terminate the current award for the Sub-Recipient’s program;
- 4) Withhold further awards for the program; or
- 5) Take other remedies that may be legally available.

SCHEDULE OF WORK

State and Local Contracting:	3 Months
Construction Plan/Technical Specifications:	3 Months
Bidding:	3 Months
Construction:	17 Months
State and Local Inspections:	6 Months
Closeout Compliance:	6 Months
Total Period of Performance:	38 Months

BUDGET

Line Item Budget*

	Project Cost	Federal Share	Non-Federal Share
Materials:	\$3,374,035.00	\$634,842.24	\$2,739,192.76
Labor:	\$0.00	\$0.00	\$0.00
Fees:	\$50,000.00	\$9,407.76	\$40,592.24
Initial Agreement Amount:	\$3,424,035.00	\$644,250.00	\$2,779,785.00
***Contingency Funds:	\$0.00	\$0.00	\$0.00
Project Total:	\$3,424,035.00	\$644,250.00	\$2,779,785.00

**Any line item amount in this Budget may be increased or decreased 10% or less, with the Division's approval, without an amendment to this Agreement being required, so long as the overall amount of the funds obligated under this Agreement is not increased.*

***** This project has an estimated \$0.00 in contingency funds.** Per FEMA Hazard Mitigation Assistance Guidance Part VI, D.3.4 – Contingency funds are not automatically available for use. Prior to their release, contingency funds must be re-budgeted to another direct cost category and identified. Post-award changes to the budget require prior written approval from the Division (FDEM). The written request should demonstrate what unforeseen condition related to the project arose that required the use of contingency funds.

Project Management costs are included for this project in the amount of \$39,478.00

Funding Summary

Federal Share:	\$644,250.00	(18.815520286%)
Non-Federal Share:	\$2,779,785.00	(81.184479714%)
Total Project Cost:	\$3,424,035.00	(100.00%)

From: [Ash, Veronica](#)
To: [Lasecki, Amanda](#); [Swift, Holly](#); [Price, Pamela](#); [Giordano, Nicole](#); [Toney, Evan](#)
Subject: [EXT] 4283-86-R, MOD #1, For Execution 4-13-2021
Date: Tuesday, April 13, 2021 4:04:06 PM
Attachments: 4283-86-R MOD#1, For Execution 4-13-2021.pdf
Importance: High

Amanda Lasecki, Grants Manager
City of Port Orange
1000 City Center Circle
Port Orange, Florida 32129

REF Project #4283-86-R

Project Title: City of Port Orange, Virginia Avenue & Monroe Street, Drainage Project

Contract #H0122

Request for Review and Approval

The proposed contract Modification is being forwarded to you electronically, if you have any questions or concerns please contact me immediately.

The Florida Division of Emergency Management (FDEM) is pleased to inform you that the modification request for the project listed above has been approved.

Attached is your copy of the proposed contract **H0122 (MOD #1)** between the **City of Port Orange (Sub-Recipient)** and the Florida Division of Emergency Management.

Please have the contract modification electronically signed by the official representative and return to us via email.

Official Representatives*:

County	Chairman of the Board of Commissioners
City	Mayor
Indian Tribe	Chief or President
Water Management District	Chairman
Non-Profit	Chairman of the Board

****If there is an official that is not listed above who is authorized to sign the contracts for your organization, please provide a copy of the organization's resolution or charter that specifically identifies the person or position that is authorized to sign.***

The electronically signed modification should then be sent via email to your grant specialist. Full execution should be no later than sixty (60) days after receipt of this e-mail for final execution. The fully executed modification sent via email will be returned to you for your files.

Submit the electronic copy of the contract to:

Veronica S. Ash, FCCM
Veronica.ash@em.myflorida.com
REF: 4283-86-R Contract

If you have questions regarding this contract, or who is authorized to sign it, please contact your Project Manager at 850-254-5835 or email at Holly.swift@em.myflorida.com

Thank you,

**Holly Swift, FCCM
Project Manager
Division of Emergency Management
2702 Directors Row
Orlando, Florida 32809-5631**

Under Florida law, correspondence with the Florida Division of Emergency Management, which is neither confidential nor exempt pursuant to Florida Statutes Chapter 119, is a public record made available upon request.



STATE OF FLORIDA

DIVISION OF EMERGENCY MANAGEMENT

RICK SCOTT
Governor

WESLEY MAUL
Director

October 29, 2018

Ms. Amanda Lasecki
Grants Manager
City of Port Orange
1000 City Center Circle
Port Orange, Florida 32129

Re: Project #4283-86-R, City of Port Orange

Dear Ms. Lasecki:

Enclosed is the executed Hazard Mitigation Grant Program (HMGP) contract number H0112 between the City of Port Orange and the Division of Emergency Management. Additional assistance is available regarding your Project on the Florida Division of Emergency Management Website:
<http://www.floridadisaster.org/Mitigation/Hazard/index.htm>. Please reference the heading: "Grant Management Tools Listed Below" which contains sample documents that will provide guidance for completing requests for reimbursement, reporting requirements and supporting documents containing important points, and subgrantee close-out checklists.

Please forward all Requests for Reimbursement (Attachment D) to the Division of Emergency Management at the following address:

Holly Swift, Project Manager
Florida Division of Emergency Management
2702 Directors Row
Orlando, Florida 32809-5631

If you have any specific questions regarding the contract or the Request for Reimbursement form, please contact Holly Swift at (850) 815-4570.

Respectfully,

Miles E. Anderson
Bureau Chief, Mitigation
State Hazard Mitigation Officer

RECEIVED

NOV 02 2018

FINANCE

MEA:vsa
Enclosure

Agreement Number: H0112

Project Number: 4283-86-R

FEDERALLY-FUNDED SUBAWARD AND GRANT AGREEMENT

2 C.F.R. §200.92 states that a "subaward may be provided through any form of legal agreement, including an agreement that the pass-through entity considers a contract."

As defined by 2 C.F.R. §200.74, "pass-through entity" means "a non-Federal entity that provides a subaward to a Sub-Recipient to carry out part of a Federal program."

As defined by 2 C.F.R. §200.93, "Sub-Recipient" means "a non-Federal entity that receives a subaward from a pass-through entity to carry out part of a Federal program."

As defined by 2 C.F.R. §200.38, "Federal award" means "Federal financial assistance that a non-Federal entity receives directly from a Federal awarding agency or indirectly from a pass-through entity."

As defined by 2 C.F.R. §200.92, "subaward" means "an award provided by a pass-through entity to a Sub-Recipient for the Sub-Recipient to carry out part of a Federal award received by the pass-through entity."

The following information is provided pursuant to 2 C.F.R. §200.331(a)(1):

Sub-Recipient's name:	<u>City of Port Orange</u>
Sub-Recipient's unique entity identifier:	<u>59-6000412</u>
Federal Award Identification Number (FAIN):	<u>FEMA-DR-4283-FL</u>
Federal Award Date:	<u>August 20, 2018</u>
Subaward Period of Performance Start and End Date:	<u>Upon Execution thru January 31, 2021</u>
Amount of Federal Funds Obligated by this Agreement:	<u>\$644,250.00</u>
Total Amount of Federal Funds Obligated to the Sub-Recipient by the pass-through entity to include this Agreement:	<u>\$644,250.00</u>
Total Amount of the Federal Award committed to the Sub-Recipient by the pass-through entity	<u>\$644,250.00</u>
Federal award project description (see FFATA):	<u>City of Port Orange – Drainage Project</u>
Name of Federal awarding agency:	<u>Federal Emergency Management Agency</u>
Name of pass-through entity:	<u>FL Division of Emergency Management</u>
Contact information for the pass-through entity:	<u>Holly.Swift@em.myflorida.com</u>
Catalog of Federal Domestic Assistance (CFDA) Number and Name:	<u>97.039 Hazard Mitigation Grant Program</u>
Whether the award is R&D:	<u>N/A</u>
Indirect cost rate for the Federal award:	<u>N/A</u>

THIS AGREEMENT is entered into by the State of Florida, Division of Emergency Management, with headquarters in Tallahassee, Florida (hereinafter referred to as the "Division"), and the City of Port Orange, (hereinafter referred to as the "Sub-Recipient").

For the purposes of this Agreement, the Division serves as the pass-through entity for a Federal award, and the Sub-Recipient serves as the recipient of a subaward.

THIS AGREEMENT IS ENTERED INTO BASED ON THE FOLLOWING REPRESENTATIONS:

A. The Sub-Recipient represents that it is fully qualified and eligible to receive these grant funds to provide the services identified herein;

B. The State of Florida received these grant funds from the Federal government, and the Division has the authority to subgrant these funds to the Sub-Recipient upon the terms and conditions outlined below; and,

C. The Division has statutory authority to disburse the funds under this Agreement.

THEREFORE, the Division and the Sub-Recipient agree to the following:

(1) APPLICATION OF STATE LAW TO THIS AGREEMENT

2 C.F.R. §200.302 provides: "Each state must expend and account for the Federal award in accordance with state laws and procedures for expending and accounting for the state's own funds." Therefore, section 215.971, Florida Statutes, entitled "Agreements funded with federal or state assistance", applies to this Agreement.

(2) LAWS, RULES, REGULATIONS AND POLICIES

a. The Sub-Recipient's performance under this Agreement is subject to 2 C.F.R. Part 200, entitled "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards."

b. As required by Section 215.971(1), Florida Statutes, this Agreement includes:

i. A provision specifying a scope of work that clearly establishes the tasks that the Sub-Recipient is required to perform.

ii. A provision dividing the agreement into quantifiable units of deliverables that must be received and accepted in writing by the Division before payment. Each deliverable must be directly related to the scope of work and specify the required minimum level of service to be performed and the criteria for evaluating the successful completion of each deliverable.

iii. A provision specifying the financial consequences that apply if the Sub-Recipient fails to perform the minimum level of service required by the agreement.

iv. A provision specifying that the Sub-Recipient may expend funds only for allowable costs resulting from obligations incurred during the specified agreement period.

v. A provision specifying that any balance of unobligated funds which has been advanced or paid must be refunded to the Division.

vi. A provision specifying that any funds paid in excess of the amount to which the Sub-Recipient is entitled under the terms and conditions of the agreement must be refunded to the Division.

c. In addition to the foregoing, the Sub-Recipient and the Division shall be governed by all applicable State and Federal laws, rules and regulations, including those identified in Attachment B. Any express reference in this Agreement to a particular statute, rule, or regulation in no way implies that no other statute, rule, or regulation applies.

(3) CONTACT

a. In accordance with section 215.971(2), Florida Statutes, the Division's Grant Manager shall be responsible for enforcing performance of this Agreement's terms and conditions and shall serve as the Division's liaison with the Sub-Recipient. As part of his/her duties, the Grant Manager for the Division shall:

- i. Monitor and document Sub-Recipient performance; and,
- ii. Review and document all deliverables for which the Sub-Recipient requests payment.

b. The Division's Grant Manager for this Agreement is:

Holly Swift, Project Manager
Division of Emergency Management
Bureau of Mitigation
2702 Directors Row
Orlando, Florida 32809-5631
Telephone: (850) 815-4570
Email: Holly.Swift@em.myflorida.com

c. The name and address of the Representative of the Sub-Recipient responsible for the administration of this Agreement is:

Amanda Lasecki, Grants Manager
City of Port Orange
1000 City Center Circle
Port Orange, Florida 32129
Telephone: (386) 506-5737
Email: alasecki@port-orange.org

d. In the event that different representatives or addresses are designated by either party after execution of this Agreement, notice of the name, title and address of the new representative will be provided to the other party.

(4) TERMS AND CONDITIONS

This Agreement contains all the terms and conditions agreed upon by the parties.

(5) EXECUTION

This Agreement may be executed in any number of counterparts, any one of which may be taken as an original.

(6) MODIFICATION

Either party may request modification of the provisions of this Agreement. Changes which are agreed upon shall be valid only when in writing, signed by each of the parties, and attached to the original of this Agreement.

(7) SCOPE OF WORK.

The Sub-Recipient shall perform the work in accordance with the Budget and Scope of Work, Attachment A of this Agreement.

(8) PERIOD OF AGREEMENT.

This Agreement shall begin upon execution by both parties and shall end on **January 31, 2021**, unless terminated earlier in accordance with the provisions of Paragraph (17) of this Agreement. Consistent with the definition of "period of performance" contained in 2 C.F.R. §200.77, the term "period of agreement" refers to the time during which the Sub-Recipient "may incur new obligations to carry out the work authorized under" this Agreement. In accordance with 2 C.F.R. §200.309, the Sub-Recipient may receive reimbursement under this Agreement only for "allowable costs incurred during the period of performance." In accordance with section 215.971(1)(d), Florida Statutes, the Sub-Recipient may expend funds authorized by this Agreement "only for allowable costs resulting from obligations incurred during" the period of agreement.

(9) FUNDING

- a. This is a cost-reimbursement Agreement, subject to the availability of funds.
- b. The State of Florida's performance and obligation to pay under this Agreement is contingent upon an annual appropriation by the Legislature, and subject to any modification in accordance with either Chapter 216, Florida Statutes, or the Florida Constitution.
- c. The Division will reimburse the Sub-Recipient only for allowable costs incurred by the Sub-Recipient in the successful completion of each deliverable. The maximum reimbursement amount for each deliverable is outlined in Attachment A of this Agreement ("Budget and Scope of Work"). The maximum reimbursement amount for the entirety of this Agreement is **\$644,250.00.**
- d. As required by 2 C.F.R. §200.415(a), any request for payment under this Agreement must include a certification, signed by an official who is authorized to legally bind the Sub-Recipient, which reads as follows: "By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and objectives set forth in the terms and conditions of the Federal award. I am aware that any

false, fictitious, or fraudulent information, or the omission of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (U.S. Code Title 18, Section 1001 and Title 31, Sections 3729-3730 and 3801-3812)."

e. The Division will review any request for reimbursement by comparing the documentation provided by the Sub-Recipient against a performance measure, outlined in Attachment A, that clearly delineates:

- i. The required minimum acceptable level of service to be performed; and,
- ii. The criteria for evaluating the successful completion of each deliverable.

f. The performance measure required by section 215.971(1)(b), Florida Statutes, remains consistent with the requirement for a "performance goal", which is defined in 2 C.F.R. §200.76 as "a target level of performance expressed as a tangible, measurable objective, against which actual achievement can be compared." It also remains consistent with the requirement, contained in 2 C.F.R. §200.301, that the Division and the Sub-Recipient "relate financial data to performance accomplishments of the Federal award."

g. If authorized by the Federal Awarding Agency, then the Division will reimburse the Sub-Recipient for overtime expenses in accordance with 2 C.F.R. §200.430 ("Compensation—personal services") and 2 C.F.R. §200.431 ("Compensation—fringe benefits"). If the Sub-Recipient seeks reimbursement for overtime expenses for periods when no work is performed due to vacation, holiday, illness, failure of the employer to provide sufficient work, or other similar cause (*see* 29 U.S.C. §207(e)(2)), then the Division will treat the expense as a fringe benefit. 2 C.F.R. §200.431(a) defines fringe benefits as "allowances and services provided by employers to their employees as compensation in addition to regular salaries and wages." Fringe benefits are allowable under this Agreement as long as the benefits are reasonable and are required by law, Sub-Recipient-employee agreement, or an established policy of the Sub-Recipient. 2 C.F.R. §200.431(b) provides that the cost of fringe benefits in the form of regular compensation paid to employees during periods of authorized absences from the job, such as for annual leave, family-related leave, sick leave, holidays, court leave, military leave, administrative leave, and other similar benefits, are allowable if all of the following criteria are met:

- i. They are provided under established written leave policies;
- ii. The costs are equitably allocated to all related activities, including Federal awards; and,
- iii. The accounting basis (cash or accrual) selected for costing each type of leave is consistently followed by the non-Federal entity or specified grouping of employees.

h. If authorized by the Federal Awarding Agency, then the Division will reimburse the Sub-Recipient for travel expenses in accordance with 2 C.F.R. §200.474. As required by the Reference Guide for State Expenditures, reimbursement for travel must be in accordance with section 112.061, Florida Statutes, which includes submission of the claim on the approved state travel voucher. If the Sub-Recipient seeks reimbursement for travel costs that exceed the amounts stated in section 112.061(6)(b),

Florida Statutes (\$6 for breakfast, \$11 for lunch, and \$19 for dinner), then the Sub-Recipient must provide documentation that:

- i. The costs are reasonable and do not exceed charges normally allowed by the Sub-Recipient in its regular operations as a result of the Sub-Recipient's written travel policy; and,
 - ii. Participation of the individual in the travel is necessary to the Federal award.
- i. The Division's grant manager, as required by section 215.971(2)(c), Florida Statutes, shall reconcile and verify all funds received against all funds expended during the grant agreement period and produce a final reconciliation report. The final report must identify any funds paid in excess of the expenditures incurred by the Sub-Recipient.
- j. As defined by 2 C.F.R. §200.53, the term "improper payment" means or includes:
- i. Any payment that should not have been made or that was made in an incorrect amount (including overpayments and underpayments) under statutory, contractual, administrative, or other legally applicable requirements; and,
 - ii. Any payment to an ineligible party, any payment for an ineligible good or service, any duplicate payment, any payment for a good or service not received (except for such payments where authorized by law), any payment that does not account for credit for applicable discounts, and any payment where insufficient or lack of documentation prevents a reviewer from discerning whether a payment was proper.

(10) RECORDS

a. As required by 2 C.F.R. §200.336, the Federal awarding agency, Inspectors General, the Comptroller General of the United States, and the Division, or any of their authorized representatives, shall enjoy the right of access to any documents, papers, or other records of the Sub-Recipient which are pertinent to the Federal award, in order to make audits, examinations, excerpts, and transcripts. The right of access also includes timely and reasonable access to the Sub-Recipient's personnel for the purpose of interview and discussion related to such documents. Finally, the right of access is not limited to the required retention period but lasts as long as the records are retained.

b. As required by 2 C.F.R. §200.331(a)(5), the Division, the Chief Inspector General of the State of Florida, the Florida Auditor General, or any of their authorized representatives, shall enjoy the right of access to any documents, financial statements, papers, or other records of the Sub-Recipient which are pertinent to this Agreement, in order to make audits, examinations, excerpts, and transcripts. The right of access also includes timely and reasonable access to the Sub-Recipient's personnel for the purpose of interview and discussion related to such documents.

c. As required by Florida Department of State's record retention requirements (Chapter 119, Florida Statutes) and by 2 C.F.R. §200.333, the Sub-Recipient shall retain sufficient records to show its compliance with the terms of this Agreement, as well as the compliance of all subcontractors or consultants paid from funds under this Agreement, for a period of five (5) fiscal years from the date of

completion of grant cycle or project. The following are the only exceptions to the five (5) year requirement:

- i. If any litigation, claim, or audit is started before the expiration of the 5-year period, then the records must be retained until all litigation, claims, or audit findings involving the records have been resolved and final action taken.
 - ii. When the Division or the Sub-Recipient is notified in writing by the Federal awarding agency, cognizant agency for audit, oversight agency for audit, cognizant agency for indirect costs, or pass-through entity to extend the retention period.
 - iii. Records for real property and equipment acquired with Federal funds must be retained for 5 years after final disposition.
 - iv. When records are transferred to or maintained by the Federal awarding agency or pass-through entity, the 5-year retention requirement is not applicable to the Sub-Recipient.
 - v. Records for program income transactions after the period of performance. In some cases recipients must report program income after the period of performance. Where there is such a requirement, the retention period for the records pertaining to the earning of the program income starts from the end of the non-Federal entity's fiscal year in which the program income is earned.
 - vi. Indirect cost rate proposals and cost allocations plans. This paragraph applies to the following types of documents and their supporting records: indirect cost rate computations or proposals, cost allocation plans, and any similar accounting computations of the rate at which a particular group of costs is chargeable (such as computer usage chargeback rates or composite fringe benefit rates).
- d. In accordance with 2 C.F.R. §200.334, the Federal awarding agency must request transfer of certain records to its custody from the Division or the Sub-Recipient when it determines that the records possess long-term retention value.
 - e. In accordance with 2 C.F.R. §200.335, the Division must always provide or accept paper versions of Agreement information to and from the Sub-Recipient upon request. If paper copies are submitted, then the Division must not require more than an original and two copies. When original records are electronic and cannot be altered, there is no need to create and retain paper copies. When original records are paper, electronic versions may be substituted through the use of duplication or other forms of electronic media provided that they are subject to periodic quality control reviews, provide reasonable safeguards against alteration, and remain readable.
 - f. As required by 2 C.F.R. §200.303, the Sub-Recipient shall take reasonable measures to safeguard protected personally identifiable information and other information the Federal awarding agency or the Division designates as sensitive or the Sub-Recipient considers sensitive consistent with applicable Federal, state, local, and tribal laws regarding privacy and obligations of confidentiality.
 - g. Florida's Government in the Sunshine Law (Section 286.011, Florida Statutes) provides the citizens of Florida with a right of access to governmental proceedings and mandates three,

basic requirements: (1) meetings of public boards or commissions must be open to the public; (2) reasonable notice of such meetings must be given; and, (3) minutes of the meetings must be taken and promptly recorded. The mere receipt of public funds by a private entity, standing alone, is insufficient to bring that entity within the ambit of the open government requirements. However, the Government in the Sunshine Law applies to private entities that provide services to governmental agencies and that act on behalf of those agencies in the agencies' performance of their public duties. If a public agency delegates the performance of its public purpose to a private entity, then, to the extent that private entity is performing that public purpose, the Government in the Sunshine Law applies. For example, if a volunteer fire department provides firefighting services to a governmental entity and uses facilities and equipment purchased with public funds, then the Government in the Sunshine Law applies to board of directors for that volunteer fire department. Thus, to the extent that the Government in the Sunshine Law applies to the Sub-Recipient based upon the funds provided under this Agreement, the meetings of the Sub-Recipient's governing board or the meetings of any subcommittee making recommendations to the governing board may be subject to open government requirements. These meetings shall be publicly noticed, open to the public, and the minutes of all the meetings shall be public records, available to the public in accordance with Chapter 119, Florida Statutes.

h. Florida's Public Records Law provides a right of access to the records of the state and local governments as well as to private entities acting on their behalf. Unless specifically exempted from disclosure by the Legislature, all materials made or received by a governmental agency (or a private entity acting on behalf of such an agency) in conjunction with official business which are used to perpetuate, communicate, or formalize knowledge qualify as public records subject to public inspection. The mere receipt of public funds by a private entity, standing alone, is insufficient to bring that entity within the ambit of the public record requirements. However, when a public entity delegates a public function to a private entity, the records generated by the private entity's performance of that duty become public records. Thus, the nature and scope of the services provided by a private entity determine whether that entity is acting on behalf of a public agency and is therefore subject to the requirements of Florida's Public Records Law.

i. The Sub-Recipient shall maintain all records for the Sub-Recipient and for all subcontractors or consultants to be paid from funds provided under this Agreement, including documentation of all program costs, in a form sufficient to determine compliance with the requirements and objectives of the Budget and Scope of Work - Attachment A - and all other applicable laws and regulations.

(11)AUDITS

a. The Sub-Recipient shall comply with the audit requirements contained in 2 C.F.R. Part 200, Subpart F.

b. In accounting for the receipt and expenditure of funds under this Agreement, the Sub-Recipient shall follow Generally Accepted Accounting Principles ("GAAP"). As defined by 2 C.F.R.

§200.49, GAAP "has the meaning specified in accounting standards issued by the Government Accounting Standards Board (GASB) and the Financial Accounting Standards Board (FASB)."

c. When conducting an audit of the Sub-Recipient's performance under this Agreement, the Division shall use Generally Accepted Government Auditing Standards ("GAGAS"). As defined by 2 C.F.R. §200.50, GAGAS, "also known as the Yellow Book, means generally accepted government auditing standards issued by the Comptroller General of the United States, which are applicable to financial audits."

d. If an audit shows that all or any portion of the funds disbursed were not spent in accordance with the conditions of this Agreement, the Sub-Recipient shall be held liable for reimbursement to the Division of all funds not spent in accordance with these applicable regulations and Agreement provisions within thirty days after the Division has notified the Sub-Recipient of such non-compliance.

e. The Sub-Recipient shall have all audits completed by an independent auditor, which is defined in section 215.97(2)(h), Florida Statutes, as "an independent certified public accountant licensed under chapter 473." The independent auditor shall state that the audit complied with the applicable provisions noted above. The audit must be received by the Division no later than nine months from the end of the Sub-Recipient's fiscal year.

f. The Sub-Recipient shall send copies of reporting packages for audits conducted in accordance with 2 C.F.R. Part 200, by or on behalf of the Sub-Recipient, to the Division at the following address:

DEMSingle_Audit@em.myflorida.com

OR

Office of the Inspector General
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

g. The Sub-Recipient shall send the Single Audit reporting package and Form SF-SAC to the Federal Audit Clearinghouse by submission online at:

<http://harvester.census.gov/fac/collect/ddeindex.html>

h. The Sub-Recipient shall send any management letter issued by the auditor to the Division at the following address:

DEMSingle_Audit@em.myflorida.com

OR

Office of the Inspector General
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

(12)REPORTS

a. Consistent with 2 C.F.R. §200.328, the Sub-Recipient shall provide the Division with quarterly reports and a close-out report. These reports shall include the current status and progress by the Sub-Recipient and all subcontractors in completing the work described in the Scope of Work and the expenditure of funds under this Agreement, in addition to any other information requested by the Division.

b. Quarterly reports are due to the Division no later than 15 days after the end of each quarter of the program year and shall be sent each quarter until submission of the administrative close-out report. The ending dates for each quarter of the program year are March 31, June 30, September 30 and December 31.

c. The close-out report is due 60 days after termination of this Agreement or 60 days after completion of the activities contained in this Agreement, whichever first occurs.

d. If all required reports and copies are not sent to the Division or are not completed in a manner acceptable to the Division, then the Division may withhold further payments until they are completed or may take other action as stated in Paragraph (16) REMEDIES. "Acceptable to the Division" means that the work product was completed in accordance with the Budget and Scope of Work.

e. The Sub-Recipient shall provide additional program updates or information that may be required by the Division.

f. The Sub-Recipient shall provide additional reports and information identified in Attachment F.

(13)MONITORING

a. The Sub-Recipient shall monitor its performance under this Agreement, as well as that of its subcontractors and/or consultants who are paid from funds provided under this Agreement, to ensure that time schedules are being met, the Schedule of Deliverables and Scope of Work are being accomplished within the specified time periods, and other performance goals are being achieved. A review shall be done for each function or activity in Attachment A to this Agreement, and reported in the quarterly report.

b. In addition to reviews of audits, monitoring procedures may include, but not be limited to, on-site visits by Division staff, limited scope audits, and/or other procedures. The Sub-Recipient agrees to comply and cooperate with any monitoring procedures/processes deemed appropriate by the Division. In the event that the Division determines that a limited scope audit of the Sub-Recipient is appropriate, the Sub-Recipient agrees to comply with any additional instructions provided by the Division to the Sub-Recipient regarding such audit. The Sub-Recipient further agrees to comply and cooperate with any inspections, reviews, investigations or audits deemed necessary by the Florida Chief Financial Officer or Auditor General. In addition, the Division will monitor the performance and financial management by the Sub-Recipient throughout the contract term to ensure timely completion of all tasks.

(14)LIABILITY

a. Unless Sub-Recipient is a State agency or subdivision, as defined in section 768.28(2), Florida Statutes, the Sub-Recipient is solely responsible to parties it deals with in carrying out the terms of this Agreement; as authorized by section 768.28(19), Florida Statutes, Sub-Recipient shall hold the Division harmless against all claims of whatever nature by third parties arising from the work performance under this Agreement. For purposes of this Agreement, Sub-Recipient agrees that it is not an employee or agent of the Division, but is an independent contractor.

b. As required by section 768.28(19), Florida Statutes, any Sub-Recipient which is a state agency or subdivision, as defined in section 768.28(2), Florida Statutes, agrees to be fully responsible for its negligent or tortious acts or omissions which result in claims or suits against the Division, and agrees to be liable for any damages proximately caused by the acts or omissions to the extent set forth in Section 768.28, Florida Statutes. Nothing herein is intended to serve as a waiver of sovereign immunity by any Sub-Recipient to which sovereign immunity applies. Nothing herein shall be construed as consent by a state agency or subdivision of the State of Florida to be sued by third parties in any matter arising out of any contract.

(15)DEFAULT.

If any of the following events occur ("Events of Default"), all obligations on the part of the Division to make further payment of funds shall terminate and the Division has the option to exercise any of its remedies set forth in Paragraph (16); however, the Division may make payments or partial payments after any Events of Default without waiving the right to exercise such remedies, and without becoming liable to make any further payment if:

a. Any warranty or representation made by the Sub-Recipient in this Agreement or any previous agreement with the Division is or becomes false or misleading in any respect, or if the Sub-Recipient fails to keep or perform any of the obligations, terms or covenants in this Agreement or any previous agreement with the Division and has not cured them in timely fashion, or is unable or unwilling to meet its obligations under this Agreement;

b. Material adverse changes occur in the financial condition of the Sub-Recipient at any time during the term of this Agreement, and the Sub-Recipient fails to cure this adverse change within thirty days from the date written notice is sent by the Division;

c. Any reports required by this Agreement have not been submitted to the Division or have been submitted with incorrect, incomplete or insufficient information; or,

d. The Sub-Recipient has failed to perform and complete on time any of its obligations under this Agreement.

(16)REMEDIES.

If an Event of Default occurs, then the Division shall, after thirty calendar days written notice to the Sub-Recipient and upon the Sub-Recipient's failure to cure within those thirty days, exercise any one or more of the following remedies, either concurrently or consecutively:

a. Terminate this Agreement, provided that the Sub-Recipient is given at least thirty days prior written notice of the termination. The notice shall be effective when placed in the United States, first class mail, postage prepaid, by registered or certified mail-return receipt requested, to the address in paragraph (3) herein;

b. Begin an appropriate legal or equitable action to enforce performance of this Agreement;

c. Withhold or suspend payment of all or any part of a request for payment;

d. Require that the Sub-Recipient refund to the Division any monies used for ineligible purposes under the laws, rules and regulations governing the use of these funds.

e. Exercise any corrective or remedial actions, to include but not be limited to:

i. Request additional information from the Sub-Recipient to determine the reasons for or the extent of non-compliance or lack of performance,

ii. Issue a written warning to advise that more serious measures may be taken if the situation is not corrected,

iii. Advise the Sub-Recipient to suspend, discontinue or refrain from incurring costs for any activities in question or

iv. Require the Sub-Recipient to reimburse the Division for the amount of costs incurred for any items determined to be ineligible;

f. Exercise any other rights or remedies which may be available under law.

Pursuing any of the above remedies will not stop the Division from pursuing any other remedies in this Agreement or provided at law or in equity. If the Division waives any right or remedy in this Agreement or fails to insist on strict performance by the Sub-Recipient, it will not affect, extend or waive any other right or remedy of the Division, or affect the later exercise of the same right or remedy by the Division for any other default by the Sub-Recipient.

(17)TERMINATION.

a. The Division may terminate this Agreement for cause after thirty days written notice. Cause can include misuse of funds, fraud, lack of compliance with applicable rules, laws and regulations, failure to perform on time, and refusal by the Sub-Recipient to permit public access to any document, paper, letter, or other material subject to disclosure under Chapter 119, Florida Statutes, as amended.

b. The Division may terminate this Agreement for convenience or when it determines, in its sole discretion that continuing the Agreement would not produce beneficial results in line with the further expenditure of funds, by providing the Sub-Recipient with thirty calendar day's prior written notice.

c. The parties may agree to terminate this Agreement for their mutual convenience through a written amendment of this Agreement. The amendment will state the effective date of the termination and the procedures for proper closeout of the Agreement.

d. In the event that this Agreement is terminated, the Sub-Recipient will not incur new obligations for the terminated portion of the Agreement after the Sub-Recipient has received the

notification of termination. The Sub-Recipient will cancel as many outstanding obligations as possible. Costs incurred after receipt of the termination notice will be disallowed. The Sub-Recipient shall not be relieved of liability to the Division because of any breach of Agreement by the Sub-Recipient. The Division may, to the extent authorized by law, withhold payments to the Sub-Recipient for the purpose of set-off until the exact amount of damages due the Division from the Sub-Recipient is determined.

(18)PROCUREMENT

a. The Sub-Recipient shall ensure that any procurement involving funds authorized by the Agreement complies with all applicable federal and state laws and regulations, to include 2 C.F.R. §§200.318 through 200.326 as well as Appendix II to 2 C.F.R. Part 200 (entitled "Contract Provisions for Non-Federal Entity Contracts Under Federal Awards").

b. As required by 2 C.F.R. §200.318(b), the Sub-Recipient shall "maintain records sufficient to detail the history of procurement. These records will include, but are not necessarily limited to the following: rationale for the method of procurement, selection of contract type, contractor selection or rejection, and the basis for the contract price."

c. As required by 2 C.F.R. §200.318(i), the Sub-Recipient shall "maintain oversight to ensure that contractors perform in accordance with the terms, conditions, and specifications of their contracts or purchase orders." In order to demonstrate compliance with this requirement, the Sub-Recipient shall document, in its quarterly report to the Division, the progress of any and all subcontractors performing work under this Agreement.

d. Except for procurements by micro-purchases pursuant to 2 C.F.R. §200.320(a) or procurements by small purchase procedures pursuant to 2 C.F.R. §200.320(b), if the Sub-Recipient chooses to subcontract any of the work required under this Agreement, then the Sub-Recipient shall forward to the Division a copy of any solicitation (whether competitive or non-competitive) at least fifteen (15) days prior to the publication or communication of the solicitation. The Division shall review the solicitation and provide comments, if any, to the Sub-Recipient within three (3) business days. Consistent with 2 C.F.R. §200.324, the Division will review the solicitation for compliance with the procurement standards outlined in 2 C.F.R. §§200.318 through 200.326 as well as Appendix II to 2 C.F.R. Part 200. Consistent with 2 C.F.R. §200.318(k), the Division will not substitute its judgment for that of the Sub-Recipient. While the Sub-Recipient does not need the approval of the Division in order to publish a competitive solicitation, this review may allow the Division to identify deficiencies in the vendor requirements or in the commodity or service specifications. The Division's review and comments shall not constitute an approval of the solicitation. Regardless of the Division's review, the Sub-Recipient remains bound by all applicable laws, regulations, and agreement terms. If during its review the Division identifies any deficiencies, then the Division shall communicate those deficiencies to the Sub-Recipient as quickly as possible within the three (3) business day window outlined above. If the Sub-Recipient publishes a competitive solicitation after receiving comments from the Division that the solicitation is deficient, then the Division may:

i. Terminate this Agreement in accordance with the provisions outlined in paragraph (17) above; and,

ii. Refuse to reimburse the Sub-Recipient for any costs associated with that solicitation.

e. Except for procurements by micro-purchases pursuant to 2 C.F.R. §200.320(a) or procurements by small purchase procedures pursuant to 2 C.F.R. §200.320(b), if the Sub-Recipient chooses to subcontract any of the work required under this Agreement, then the Sub-Recipient shall forward to the Division a copy of any contemplated contract prior to contract execution. The Division shall review the unexecuted contract and provide comments, if any, to the Sub-Recipient within three (3) business days. Consistent with 2 C.F.R. §200.324, the Division will review the unexecuted contract for compliance with the procurement standards outlined in 2 C.F.R. §§200.318 through 200.326 as well as Appendix II to 2 C.F.R. Part 200. Consistent with 2 C.F.R. §200.318(k), the Division will not substitute its judgment for that of the Sub-Recipient. While the Sub-Recipient does not need the approval of the Division in order to execute a subcontract, this review may allow the Division to identify deficiencies in the terms and conditions of the subcontract as well as deficiencies in the procurement process that led to the subcontract. The Division's review and comments shall not constitute an approval of the subcontract. Regardless of the Division's review, the Sub-Recipient remains bound by all applicable laws, regulations, and agreement terms. If during its review the Division identifies any deficiencies, then the Division shall communicate those deficiencies to the Sub-Recipient as quickly as possible within the three (3) business day window outlined above. If the Sub-Recipient executes a subcontract after receiving a communication from the Division that the subcontract is non-compliant, then the Division may:

i. Terminate this Agreement in accordance with the provisions outlined in paragraph (17) above; and,

ii. Refuse to reimburse the Sub-Recipient for any costs associated with that subcontract.

f. The Sub-Recipient agrees to include in the subcontract that (i) the subcontractor is bound by the terms of this Agreement, (ii) the subcontractor is bound by all applicable state and federal laws and regulations, and (iii) the subcontractor shall hold the Division and Sub-Recipient harmless against all claims of whatever nature arising out of the subcontractor's performance of work under this Agreement, to the extent allowed and required by law.

g. As required by 2 C.F.R. §200.318(c)(1), the Sub-Recipient shall "maintain written standards of conduct covering conflicts of interest and governing the actions of its employees engaged in the selection, award and administration of contracts."

h. As required by 2 C.F.R. §200.319(a), the Sub-Recipient shall conduct any procurement under this agreement "in a manner providing full and open competition." Accordingly, the Sub-Recipient shall not:

- i. Place unreasonable requirements on firms in order for them to qualify to do business;
- ii. Require unnecessary experience or excessive bonding;
- iii. Use noncompetitive pricing practices between firms or between affiliated companies;
- iv. Execute noncompetitive contracts to consultants that are on retainer contracts;
- v. Authorize, condone, or ignore organizational conflicts of interest;
- vi. Specify only a brand name product without allowing vendors to offer an equivalent;
- vii. Specify a brand name product instead of describing the performance, specifications, or other relevant requirements that pertain to the commodity or service solicited by the procurement;
- viii. Engage in any arbitrary action during the procurement process; or,
- ix. Allow a vendor to bid on a contract if that bidder was involved with developing or drafting the specifications, requirements, statement of work, invitation to bid, or request for proposals.

i. "[E]xcept in those cases where applicable Federal statutes expressly mandate or encourage" otherwise, the Sub-Recipient, as required by 2 C.F.R. §200.319(b), shall not use a geographic preference when procuring commodities or services under this Agreement.

j. The Sub-Recipient shall conduct any procurement involving invitations to bid (i.e. sealed bids) in accordance with 2 C.F.R. §200.320(c) as well as section 287.057(1)(a), Florida Statutes.

k. The Sub-Recipient shall conduct any procurement involving requests for proposals (i.e. competitive proposals) in accordance with 2 C.F.R. §200.320(d) as well as section 287.057(1)(b), Florida Statutes.

l. For each subcontract, the Sub-Recipient shall provide a written statement to the Division as to whether that subcontractor is a minority business enterprise, as defined in Section 288.703, Florida Statutes. Additionally, the Sub-Recipient shall comply with the requirements of 2 C.F.R. §200.321 ("Contracting with small and minority businesses, women's business enterprises, and labor surplus area firms").

(19) ATTACHMENTS

- a. All attachments to this Agreement are incorporated as if set out fully.
- b. In the event of any inconsistencies or conflict between the language of this Agreement and the attachments, the language of the attachments shall control, but only to the extent of the conflict or inconsistency.

- c. This Agreement has the following attachments:
- i. Exhibit 1 - Funding Sources
 - ii. Attachment A – Budget and Scope of Work
 - iii. Attachment B – Program Statutes and Regulations
 - iv. Attachment C – Statement of Assurances
 - v. Attachment D – Request for Advance or Reimbursement
 - vi. Attachment E – Justification of Advance Payment
 - vii. Attachment F – Quarterly Report Form
 - viii. Attachment G – Warranties and Representations
 - ix. Attachment H – Certification Regarding Debarment
 - x. Attachment I – Federal Funding Accountability and Transparency Act
 - xi. Attachment J – Mandatory Contract Provisions

(20)PAYMENTS

a. Any advance payment under this Agreement is subject to 2 C.F.R. §200.305 and, as applicable, section 216.181(16), Florida Statutes. All advances are required to be held in an interest-bearing account. If an advance payment is requested, the budget data on which the request is based and a justification statement shall be included in this Agreement as Attachment E. Attachment E will specify the amount of advance payment needed and provide an explanation of the necessity for and proposed use of these funds. No advance shall be accepted for processing if a reimbursement has been paid prior to the submittal of a request for advanced payment. After the initial advance, if any, payment shall be made on a reimbursement basis as needed.

b. Invoices shall be submitted at least quarterly and shall include the supporting documentation for all costs of the project or services. The final invoice shall be submitted within sixty (60) days after the expiration date of the agreement. An explanation of any circumstances prohibiting the submittal of quarterly invoices shall be submitted to the Division grant manager as part of the Sub-Recipient's quarterly reporting as referenced in Paragraph (12) of this Agreement.

c. If the necessary funds are not available to fund this Agreement as a result of action by the United States Congress, the federal Office of Management and Budgeting, the State Chief Financial Officer or under subparagraph (9)b. of this Agreement, all obligations on the part of the Division to make any further payment of funds shall terminate, and the Sub-Recipient shall submit its closeout report within thirty days of receiving notice from the Division.

(21)REPAYMENTS

a. All refunds or repayments due to the Division under this Agreement are to be made payable to the order of "Division of Emergency Management", and mailed directly to the following address:

Division of Emergency Management
Cashier
2555 Shumard Oak Boulevard
Tallahassee FL 32399-2100

b. In accordance with Section 215.34(2), Florida Statutes, if a check or other draft is returned to the Division for collection, Sub-Recipient shall pay the Division a service fee of \$15.00 or 5% of the face amount of the returned check or draft, whichever is greater.

(22)MANDATED CONDITIONS

a. The validity of this Agreement is subject to the truth and accuracy of all the information, representations, and materials submitted or provided by the Sub-Recipient in this Agreement, in any later submission or response to a Division request, or in any submission or response to fulfill the requirements of this Agreement. All of said information, representations, and materials are incorporated by reference. The inaccuracy of the submissions or any material changes shall, at the option of the Division and with thirty days written notice to the Sub-Recipient, cause the termination of this Agreement and the release of the Division from all its obligations to the Sub-Recipient.

b. This Agreement shall be construed under the laws of the State of Florida, and venue for any actions arising out of this Agreement shall be in the Circuit Court of Leon County. If any provision of this Agreement is in conflict with any applicable statute or rule, or is unenforceable, then the provision shall be null and void to the extent of the conflict, and shall be severable, but shall not invalidate any other provision of this Agreement.

c. Any power of approval or disapproval granted to the Division under the terms of this Agreement shall survive the term of this Agreement.

d. The Sub-Recipient agrees to comply with the Americans With Disabilities Act (Public Law 101-336, 42 U.S.C. Section 12101 et seq.), which prohibits discrimination by public and private entities on the basis of disability in employment, public accommodations, transportation, State and local government services, and telecommunications.

e. Those who have been placed on the convicted vendor list following a conviction for a public entity crime or on the discriminatory vendor list may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with a public entity, and may not transact business with any public entity in

excess of \$25,000.00 for a period of 36 months from the date of being placed on the convicted vendor list or on the discriminatory vendor list.

f. Any Sub-Recipient which is not a local government or state agency, and which receives funds under this Agreement from the federal government, certifies, to the best of its knowledge and belief, that it and its principals:

i. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by a federal department or agency;

ii. Have not, within a five-year period preceding this proposal been convicted of or had a civil judgment rendered against them for fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state or local) transaction or contract under public transaction; violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

iii. Are not presently indicted or otherwise criminally or civilly charged by a governmental entity (federal, state or local) with commission of any offenses enumerated in paragraph (22) f. ii. of this certification; and,

iv. Have not within a five-year period preceding this Agreement had one or more public transactions (federal, state or local) terminated for cause or default.

g. If the Sub-Recipient is unable to certify to any of the statements in this certification, then the Sub-Recipient shall attach an explanation to this Agreement.

h. In addition, the Sub-Recipient shall send to the Division (by email or by facsimile transmission) the completed "Certification Regarding Debarment, Suspension, Ineligibility And Voluntary Exclusion" (Attachment H) for each intended subcontractor which Sub-Recipient plans to fund under this Agreement. The form must be received by the Division before the Sub-Recipient enters into a contract with any subcontractor.

i. The Division reserves the right to unilaterally cancel this Agreement if the Sub-Recipient refuses to allow public access to all documents, papers, letters or other material subject to the provisions of Chapter 119, Florida Statutes, which the Sub-Recipient created or received under this Agreement.

j. If the Sub-Recipient is allowed to temporarily invest any advances of funds under this Agreement, any interest income shall either be returned to the Division or be applied against the Division's obligation to pay the contract amount.

k. The State of Florida will not intentionally award publicly-funded contracts to any contractor who knowingly employs unauthorized alien workers, constituting a violation of the employment provisions contained in 8 U.S.C. Section 1324a(e) [Section 274A(e) of the Immigration and Nationality Act ("INA")]. The Division shall consider the employment by any contractor of unauthorized aliens a violation of Section 274A(e) of the INA. Such violation by the Sub-Recipient of the employment provisions

contained in Section 274A(e) of the INA shall be grounds for unilateral cancellation of this Agreement by the Division.

I. All unmanufactured and manufactured articles, materials and supplies which are acquired for public use under this Agreement must have been produced in the United States as required under 41 U.S.C. 10a, unless it would not be in the public interest or unreasonable in cost.

(23) LOBBYING PROHIBITION

a. 2 C.F.R. §200.450 prohibits reimbursement for costs associated with certain lobbying activities.

b. Section 216.347, Florida Statutes, prohibits "any disbursement of grants and aids appropriations pursuant to a contract or grant to any person or organization unless the terms of the grant or contract prohibit the expenditure of funds for the purpose of lobbying the Legislature, the judicial branch, or a state agency."

c. No funds or other resources received from the Division under this Agreement may be used directly or indirectly to influence legislation or any other official action by the Florida Legislature or any state agency.

d. The Sub-Recipient certifies, by its signature to this Agreement, that to the best of his or her knowledge and belief:

i. No Federal appropriated funds have been paid or will be paid, by or on behalf of the Sub-Recipient, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan or cooperative agreement.

ii. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan or cooperative agreement, the Sub-Recipient shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities."

iii. The Sub-Recipient shall require that this certification be included in the award documents for all subawards (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all Sub-Recipients shall certify and disclose.

iv. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

(24) COPYRIGHT, PATENT AND TRADEMARK

EXCEPT AS PROVIDED BELOW, ANY AND ALL PATENT RIGHTS ACCRUING UNDER OR IN CONNECTION WITH THE PERFORMANCE OF THIS AGREEMENT ARE HEREBY RESERVED TO THE STATE OF FLORIDA; AND, ANY AND ALL COPYRIGHTS ACCRUING UNDER OR IN CONNECTION WITH THE PERFORMANCE OF THIS AGREEMENT ARE HEREBY TRANSFERRED BY THE SUB-RECIPIENT TO THE STATE OF FLORIDA.

a. If the Sub-Recipient has a pre-existing patent or copyright, the Sub-Recipient shall retain all rights and entitlements to that pre-existing patent or copyright unless the Agreement provides otherwise.

b. If any discovery or invention is developed in the course of or as a result of work or services performed under this Agreement, or in any way connected with it, the Sub-Recipient shall refer the discovery or invention to the Division for a determination whether the State of Florida will seek patent protection in its name. Any patent rights accruing under or in connection with the performance of this Agreement are reserved to the State of Florida. If any books, manuals, films, or other copyrightable material are produced, the Sub-Recipient shall notify the Division. Any copyrights accruing under or in connection with the performance under this Agreement are transferred by the Sub-Recipient to the State of Florida.

c. Within thirty days of execution of this Agreement, the Sub-Recipient shall disclose all intellectual properties relating to the performance of this Agreement which he or she knows or should know could give rise to a patent or copyright. The Sub-Recipient shall retain all rights and entitlements to any pre-existing intellectual property which is disclosed. Failure to disclose will indicate that no such property exists. The Division shall then, under Paragraph (24) b., have the right to all patents and copyrights which accrue during performance of the Agreement.

d. If the Sub-Recipient qualifies as a state university under Florida law, then, pursuant to section 1004.23, Florida Statutes, any invention conceived exclusively by the employees of the Sub-Recipient shall become the sole property of the Sub-Recipient. In the case of joint inventions, that is inventions made jointly by one or more employees of both parties hereto, each party shall have an equal, undivided interest in and to such joint inventions. The Division shall retain a perpetual, irrevocable, fully-paid, nonexclusive license, for its use and the use of its contractors of any resulting patented, copyrighted or trademarked work products, developed solely by the Sub-Recipient, under this Agreement, for Florida government purposes.

(25) LEGAL AUTHORIZATION.

The Sub-Recipient certifies that it has the legal authority to receive the funds under this Agreement and that its governing body has authorized the execution and acceptance of this Agreement. The Sub-Recipient also certifies that the undersigned person has the authority to legally execute and bind Sub-Recipient to the terms of this Agreement.

(26)EQUAL OPPORTUNITY EMPLOYMENT

a. In accordance with 41 C.F.R. §60-1.4(b), the Sub-Recipient hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 CFR Chapter 60, which is paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to a grant, contract, loan insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee, the following equal opportunity clause:

During the performance of this contract, the contractor agrees as follows:

i. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

ii. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

iii. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

iv. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

v. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

vi. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared

ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

vii. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

b. The Sub-Recipient further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: provided, that if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

c. The Sub-Recipient agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

d. The Sub-Recipient further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive order. In addition, the Sub-Recipient agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the Sub-Recipient under the program with respect to which the failure or refund occurred until satisfactory

assurance of future compliance has been received from such Sub-Recipient; and refer the case to the Department of Justice for appropriate legal proceedings.

(27) COPELAND ANTI-KICKBACK ACT

The Sub-Recipient hereby agrees that, unless exempt under Federal law, it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, the following clause:

- i. Contractor. The contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.
- ii. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as the FEMA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.
- iii. Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

(28) CONTRACT WORK HOURS AND SAFETY STANDARDS

If the Sub-Recipient, with the funds authorized by this Agreement, enters into a contract that exceeds \$100,000 and involves the employment of mechanics or laborers, then any such contract must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation.

(29) CLEAN AIR ACT AND THE FEDERAL WATER POLLUTION CONTROL ACT

If the Sub-Recipient, with the funds authorized by this Agreement, enters into a contract that exceeds \$150,000, then any such contract must include the following provision:

Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387), and will report violations to FEMA and the Regional Office of the Environmental Protection Agency (EPA).

(30)SUSPENSION AND DEBARMENT

If the Sub-Recipient, with the funds authorized by this Agreement, enters into a contract, then any such contract must include the following provisions:

- i. This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such the contractor is required to verify that none of the contractor, its principals (defined at 2 C.F.R. § 180.995), or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).
- ii. The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
- iii. This certification is a material representation of fact relied upon by the Division. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to the Division, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
- iv. The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

(31)BYRD ANTI-LOBBYING AMENDMENT

If the Sub-Recipient, with the funds authorized by this Agreement, enters into a contract, then any such contract must include the following clause:

Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended). Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient.

(32) CONTRACTING WITH SMALL AND MINORITY BUSINESSES, WOMEN'S BUSINESS ENTERPRISES, AND LABOR SURPLUS AREA FIRMS

a. If the Sub-Recipient, with the funds authorized by this Agreement, seeks to procure goods or services, then, in accordance with 2 C.F.R. §200.321, the Sub-Recipient shall take the following affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used whenever possible:

- i. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
- ii. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
- iii. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
- iv. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises;
- v. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce; and
- vi. Requiring the prime contractor, if subcontracts are to be let, to take the affirmative steps listed in paragraphs i. through v. of this subparagraph.

b. The requirement outlined in subparagraph a. above, sometimes referred to as "socioeconomic contracting," does not impose an obligation to set aside either the solicitation or award of a contract to these types of firms. Rather, the requirement only imposes an obligation to carry out and document the six affirmative steps identified above.

c. The "socioeconomic contracting" requirement outlines the affirmative steps that the Sub-Recipient must take; the requirements do not preclude the Sub-Recipient from undertaking additional steps to involve small and minority businesses and women's business enterprises.

d. The requirement to divide total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises, does not authorize the Sub-Recipient to break a single project down into smaller components in order to circumvent the micro-purchase or small purchase thresholds so as to utilize streamlined acquisition procedures (e.g. "project splitting").

(33) ASSURANCES.

The Sub-Recipient shall comply with any Statement of Assurances incorporated as Attachment C.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement.

SUB-RECIPIENT: City of Port Orange

By: _____

Name and Title: Donald O. Burnette, Mayor

Date: _____

10/19/18

FID#: _____

59-6000412

STATE OF FLORIDA

DIVISION OF EMERGENCY MANAGEMENT

By: _____

Miles E. Anderson, for

Name and Title: Michael Kennett, Deputy Director

Date: _____

10-28-2018

EXHIBIT – 1

THE FOLLOWING FEDERAL RESOURCES ARE AWARDED TO THE SUB-RECIPIENT UNDER THIS AGREEMENT:

Federal Program

Federal agency: Federal Emergency Management Agency: Hazard Mitigation Grant

Catalog of Federal Domestic Assistance title and number: 97.039

Award amount: \$644,250.00

THE FOLLOWING COMPLIANCE REQUIREMENTS APPLY TO THE FEDERAL RESOURCES AWARDED UNDER THIS AGREEMENT:

- 2 CFR Part 200 Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards
- The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended, 42 U.S.C. 5121 et seq., and Related Authorities
- Sections 1361(A) of the National Flood Insurance Act of 1968, 42 U.S.C. 4104c, as amended by the National Flood Insurance Reform Act of 1994, Public Law 103-325 and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, Public Law 108-264
- 31 CFR Part 205 Rules and Procedures for Funds Transfers

Federal Program:

1. Sub-Recipient is to use funding to perform the following eligible activities:
 - Localized Minor Drainage Improvement
2. Sub-Recipient is subject to all administrative and financial requirements as set forth in this Agreement, or will be in violation of the terms of the Agreement.

Attachment A
Budget and Scope of Work

STATEMENT OF PURPOSE:

The purpose of this Scope of Work (SOW) is to improve drainage by installation of pump station in the City of Port Orange, Florida; funded through the Hazard Mitigation Grant Program (HMGP) **DR-4283-86-R**, as approved by the Florida Division of Emergency Management (Division) and the Federal Emergency Management Agency (FEMA).

The Sub-Recipient, **City of Port Orange**, agrees to administer and complete the project per sealed engineering designs and construction plans as submitted by the Sub-Recipient and subsequently approved by the Division and FEMA. The Sub-Recipient shall complete the work in accordance with all applicable Federal, State and Local Laws, Regulations and Codes.

PROJECT OVERVIEW:

As a Hazard Mitigation Grant Program project, the Sub-Recipient proposes to improve the drainage of Virginia Avenue (intersection of Grant Street), and Monroe Street, Port Orange, 32127.

The Construction scope of work proposes drainage improvements of intersection of Grant Street and Virginia Avenue. The proposed project shall include construction of a pump station, storm water ponds, installation of force main at Monroe Place and Fox Place, inlets and pipes to properly connect project area to proposed ponds. Construction of storm water pond and force main in proposed area would require acquiring land, moving any disturbed utilities and directional drilling along Fox Place. The proposed force main and diesel driven pumps would be raised 1-foot above Base Flood Elevation (BFE) and capable of removing floodwaters out of low-lying area, which is prone to standing water.

The project shall provide protection against a 25-year storm event. Activities shall be completed in strict compliance with Federal, State and Local applicable Rules and Regulations.

Project Location:

Proposed project starts approximately 50-feet west of Grant Street and Virginia Avenue, continues along Grant Street to the east; north side of the project - approx. 50 feet north of intersection of Virginia Avenue and Church Street. South side of the project approximately 100-feet south of intersection of Fox Place and Jefferson Avenue. The project ends 100-feet east of intersection of Riverside Drive and Meeker Place. Project Boundary Coordinates: (29.14245535, -80.99239573); (29.14358136, -80.98528882); (29.13402634, -80.98843858); (29.13609736, -80.98159858). Pond A (29.13790999, -80.98521282); Pond B (29.13793748, -80.98557605).

TASKS & DELIVERABLES:

A) Tasks:

- 1) The Sub-Recipient shall procure the services of a qualified and licensed Florida contractor and execute a contract with the selected bidder to complete the scope of work as approved by the Division and FEMA. The Sub-Recipient shall select the qualified, licensed Florida contractor in accordance with the Sub-Recipient's procurement policy as well as all federal and state laws and regulations. All procurement activities shall contain sufficient source documentation and be in accordance with all applicable regulations.

The Sub-Recipient shall be responsible for furnishing or contracting all labor, materials, equipment, tools, transportation and supervision and for performing all work per sealed engineering designs and construction plans presented to the Division by the Sub-Recipient and subsequently approved by the Division and FEMA.

The Sub-Recipient and contractor shall be responsible for maintaining a safe and secure worksite for the duration of the work. The contractor shall maintain all work staging areas in a neat and presentable condition.

The Sub-Recipient shall ensure that no contractors or subcontractors are debarred or suspended from participating in federally funded projects.

The selected contractor shall have a current and valid occupational license/business tax receipt issued for the type of services being performed.

The Sub-Recipient shall provide documentation demonstrating the results of the procurement process. This shall include a rationale for the method of procurement and selection of contract type, contractor selection and/or rejection and bid tabulation and listing, and the basis of contract price.

The Sub-Recipient shall provide an executed "Debarment, Suspension, Ineligibility, Voluntary Exclusion Form" for each contractor and/or subcontractor performing services under this agreement.

Executed contracts with contractors and/or subcontractors shall be provided to the Division by the Sub-Recipient.

The Sub-Recipient shall provide copies of professional licenses for contractors selected to perform services. The Sub-Recipient shall provide a copy of a current and valid occupational license or business tax receipt issued for the type of services to be performed by selected contractor.

- 2) The Sub-Recipient shall monitor and manage the installation to improve the drainage and provide flood protection

The project shall be implemented in accordance with sealed engineering designs and construction plans previously presented to the Division by the Sub-Recipient and subsequently approved by the Division and FEMA. The Sub-Recipient shall ensure that all applicable state, local and federal laws and regulations are followed and documented, as appropriate.

The project consists of the general construction and furnishing of all materials, equipment, labor and fees to minimize recurring flooding and reduce repetitive flood loss to structures and roadways.

The Sub-Recipient shall fully perform the approved project, as described in the submitted documents, in accordance with the approved scope of work, budget line item, allocation of funds and applicable terms and conditions indicated herein. The Sub-Recipient shall not deviate from the approved project terms and conditions.

Construction activities shall be completed by a qualified and licensed Florida contractor. All construction activities shall be monitored by the professional of record. The Sub-Recipient shall complete the project in accordance with all required permits. All work shall be completed in accordance with applicable codes and standards.

Upon completion of the work, the Sub-Recipient shall schedule and participate in a final inspection of the completed project by the local municipal or county official, or other approving official, as applicable. The official shall inspect and certify that all installation was in accordance with the manufacturer's specifications. Any deficiencies found during this final inspection shall be corrected by the Sub-Recipient prior to Sub-Recipient's submittal of the final inspection request to the Division.

Upon completion of Task 2, the Sub-Recipient shall submit the following documents with sufficient supporting documentation, and provide a summary of all contract scope of work and scope of work changes, if any. Additional documentation for closeout shall include:

- a) Signed and Sealed As-built project plans (drawings) by the Professional of Record, two hard copies and electronic version (via email or CD); and
- b) Letter of Completion:
 1. Affirming that the project was completed in conformance with the approved project drawings, specifications and scope; and

2. Certifying Compliance with all applicable codes;
- c) Letter verifying compliance with the National Historic Preservation Act, to include if archeological materials or human remains were encountered during project activities, if so, how they were handled.
- d) Permit(s) and verification of compliance.
 1. Copy of the As-Built Certification and Request for Conversion to Operational Phase submitted to St. Johns River Water Management District after the project was completed.
 2. Copy of the United States Army Corps of Engineers (USACE) Permit or No Permit Required (NPR). If a permit was required a copy of the Self-Certification Statement of Compliance or As-Built Certification shall be submitted.
- e) Letter verifying that unusable equipment, debris, and material were disposed of in an approved manner and location. If any significant items (or evidence thereof) were discovered during implementation of the project, and that the Sub-Recipient handled, managed, and disposed of petroleum products, hazardous materials and toxic waste in accordance to the requirements and to the satisfaction of the governing local, state, and federal agencies.
- f) Proof of compliance with Project Requirements and Conditions contained herein.
- 3) During the course of this agreement the Sub-Recipient shall submit requests for reimbursement. Adequate and complete source documentation shall be submitted to support all costs (federal share and local share) related to the project. In some cases, all project activities may not be fully complete prior to requesting reimbursement of costs incurred in completion of this scope of work; however, a partial reimbursement may be requested.

The Sub-Recipient shall submit an Affidavit signed by the Sub-Recipient's project personnel with each reimbursement request attesting to the completion of the work, disbursements or payments were made in accordance with all agreement and regulatory conditions, and that reimbursement is due and has not been previously requested.

The Sub-Recipient shall maintain accurate time records. The Sub-Recipient shall ensure invoices are accurate and any contracted services were rendered within the terms and timelines of this agreement. All supporting documentation shall agree with the requested billing period. All costs submitted for reimbursement shall contain adequate source documentation which may include but not be limited to: cancelled checks, bank statements, Electronic Funds Transfer, paid bills and invoices, payrolls, time and attendance records, contract and subcontract award documents.

Construction Expense: The Sub-Recipient shall pre-audit bills, invoices, and/or charges submitted by the contractors and subcontractors and pay the contractors and subcontractors for approved bills, invoices, and/or charges. Sub-Recipient shall ensure that all contractor/subcontractor bills, invoices, and/or charges are legitimate and clearly identify the activities being performed and associated costs.

Project Management Expenses: The Sub-Recipient shall pre-audit source documentation such as payroll records, project time sheets, attendance logs, etc. Documentation shall be detailed information describing tasks performed, hours devoted to each task, and the hourly rate charged for each hour including enough information to calculate the hourly rates based on payroll records. Employee benefits shall be clearly shown.

The Division shall review all submitted requests for reimbursement for basic accuracy of information. Further, the Division shall ensure that no unauthorized work was completed prior to the approved project start date by verifying vendor and contractor invoices. The Division shall verify that reported costs were incurred in the performance of eligible work, that the approved work was completed, and that the mitigation measures are in compliance with the approved scope of work prior to processing any requests for reimbursement.

Review and approval of any third party in-kind services, if applicable, shall be conducted by the Division in coordination with the Sub-Recipient. Quarterly reports shall be submitted by the Sub-

Recipient and received by the Division at the times provided in this agreement prior to the processing of any reimbursement.

The Sub-Recipient shall submit to the Division requests for reimbursement of actual construction and managerial costs related to the project as identified in the project application, sealed engineering designs, and construction plans. The requests for reimbursement shall include:

- a) Contractor, subcontractor, and/or vendor invoices which clearly display dates of services performed, description of services performed, location of services performed, cost of services performed, name of service provider and any other pertinent information;
- b) Proof of payment from the Sub-Recipient to the contractor, subcontractor, and/or vendor for invoiced services;
- c) Clear identification of amount of costs being requested for reimbursement as well as costs being applied against the local match amount;

The Sub-Recipient's final request for reimbursement shall include the final construction project cost. Supporting documentation shall show that all contractors and subcontractors have been paid.

B) Deliverables:

Mitigation Activities consist of drainage improvements in the City of Port Orange, Florida; project includes a pump station and storm water ponds, installation of force main at Monroe Place and Fox Place, inlets and pipes to properly connect project area to proposed ponds.

The completed project shall provide protection against a 25-year storm event.

Provided the Sub-Recipient performs in accordance with the Scope of Work outlined in this Agreement, the Division shall reimburse the Sub-Recipient based on the percentage of overall project completion.

PROJECT CONDITIONS AND REQUIREMENTS:

C) Engineering:

- 1) The Sub-Recipient shall submit to the Division an official letter stating that the project is 100% complete and ready for the Division's Final Inspection of the project.
- 2) The Sub-Recipient shall submit a signed and sealed final copy of the completed project's As-built drawings and all necessary supporting documentation, and provide a summary of all contract scope of work changes, if any.
- 3) The Sub-Recipient shall provide a copy of the Notice of commencement, and any local official Inspection Report and/or Final approval, as applicable.
- 4) The Sub-Recipient shall submit a certified letter of completion from Engineer of Record. The Sub-Recipient's Engineer of Record shall provide a formal certificate or letter affirming that the project has been completed in conformance with the approved project drawings, specifications, scope, and applicable codes.

D) Environmental:

- 1) Sub-Recipient shall follow all applicable state, local and federal laws regulations and requirements, and obtain (before starting project work) and comply with all required permits and approvals. Failure to obtain all appropriate federal, state, and local environmental permits and clearances may jeopardize federal funding. If project work is delayed for a year or more after the date of the categorical exclusion (CATEX), then coordination with and project review by regulatory agencies shall be redone.

- 2) Any change, addition or supplement to the approved Scope of Work that alters the project (including other work not funded by FEMA, but done substantially at the same time), regardless of the budget implications, shall require re-submission of the application to FEMA through the Division for National Environmental Policy Act (NEPA) re-evaluation before starting project work.
- 3) The Sub-Recipient shall monitor ground disturbing activities during construction, and if any potential archeological resources are discovered, shall immediately cease construction in that area and notify the Division and FEMA.

If human remains or intact archaeological deposits are uncovered, work in the vicinity of the discovery shall stop immediately and all reasonable measures to avoid or minimize harm to the finds shall be taken. The Sub-Recipient shall ensure that archaeological discoveries are secured in place, that access to the sensitive area is restricted, and that all reasonable measures are taken to avoid further disturbance of the discoveries.

The Sub-Recipient's contractor shall provide immediate notice of such discoveries to the Sub-Recipient. The Sub-Recipient shall notify the Florida Division of Historic Resources, the Division's State Environmental Liaison Officer and FEMA within 24 hours of the discovery. Work in the vicinity of the discovery may not resume until FEMA and the Division has completed consultation with SHPO, Tribes, and other consulting parties as necessary.

In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with ***Florida Statutes, Section 872.05***.

- 4) The Sub-Recipient is responsible for coordinating with and obtaining any required Section 404 permit(s) from the United States Army Corps of Engineers (USACE) and 401 permit(s) from the Florida Department of Environmental Protection prior to initiating work. The Sub-Recipient shall comply with all conditions and pre-construction notification requirements of the required permit(s). All coordination pertaining to these activities and compliance must be documented and maintained in the Sub-Recipient's permanent files. Failure to comply with these conditions may jeopardize funding. Verification of compliance will be required at project closeout.
- 5) Unusable equipment, debris and material shall be disposed of in an approved manner and location. In the event significant items (or evidence thereof) are discovered during implementation of the project, applicant shall handle, manage, and dispose of petroleum products, hazardous materials and toxic waste in accordance to the requirements and to the satisfaction of the governing local, state, and federal agencies. Verification of compliance is required at project closeout.
- 6) Construction vehicles and equipment used for this project shall be maintained in good working order to minimize pollutant emissions.

E) Programmatic:

- 1) A change in the scope of work *must* be approved by the Division and FEMA in advance regardless of the budget implications.
- 2) The Sub-Recipient must notify the Division as soon as significant developments becomes known, such as delays or adverse conditions that might raise costs or delay completion, or favorable conditions allowing lower costs or earlier completion.
- 3) The Sub-Recipient must "obtain prior written approval for any budget revision which would result in a need for additional funds" [44 CFR 13(c)], from the Division and FEMA.
- 4) Project is approved with the condition that the enclosed list of deliverables shall be submitted, 30-days prior to the Period of Performance date, for review and approval by the Division; for submittal to FEMA for closeout.
- 5) Any extension of the Period of Performance shall be submitted to FEMA, 60 days prior to the expiration date. Therefore, any request for a Period of Performance Extension shall be in writing

and submitted along with substantiation of new expiration date, and a new schedule of work, to the Division a minimum of seventy (70) days prior to the expiration date, for Division processing to FEMA.

- 6) The Sub-Recipient must avoid duplication of benefits between the HMGP and any other form of assistance, as required by Section 312 of the Stafford Act, and further clarification in 44 CFR 206.191.
- 7) A copy of the executed subcontract agreement must be forwarded to the Division within 10 days of execution.
- 8) If the Sub-Recipient is not the current title holder of the affected properties, the Sub-Recipients shall provide documentation confirming the property acquisition and easement rights were obtained voluntarily. If condemnation or eminent domain is used to obtain easement rights, FEMA shall not pay for any associated costs or payments to the property owner. Furthermore, FEMA shall not consider it an eligible contribution to the non-Federal cost share requirement and shall not financially participate in that component of a project if land or easements are obtained involuntarily.

This is FEMA project number **4283-86-R**, is funded under HMGP; FEMA-4283-DR-FL; and must adhere to all program guidelines established for the HMGP in accordance with the PAS Operational Agreement for Disaster 4283.

FEMA awarded this project on August 20, 2018; this Agreement shall begin upon execution by both parties, and the Period of Performance for this project shall end on **January 31, 2021**.

FINANCIAL CONSEQUENCES:

If the Sub-Recipient fails to comply with any term of the award, the Division shall take one or more of the following actions, as appropriate in the circumstances:

- 1) Temporarily withhold cash payments pending correction of the deficiency by the Sub-Recipient;
- 2) Disallow all or part of the cost of the activity or action not in compliance;
- 3) Wholly or partly suspend or terminate the current award for the Sub-Recipient's program;
- 4) Withhold further awards for the program; or
- 5) Take other remedies that may be legally available.

SCHEDULE OF WORK

State and Local Contracting	3 Months
Construction Plan/Technical Specifications:	3 Months
Bidding:	3 Months
Construction:	14 Months
Final Inspections:	3 Months
Closeout Compliance:	3 Months
Total Period of Performance:	29 Months

BUDGET**Line Item Budget***

	<u>Project Costs</u>	<u>Federal Share</u>	<u>Local Share</u>
Materials:	\$1,008,788.00	\$228,607.00	\$780,181.00
Labor:	\$1,575,682.00	\$357,075.00	\$1,218,607.00
Fees:	\$258,447.00	\$58,568.00	\$199,879.00
Total Project Costs:	\$2,842,917.00	\$644,250.00	\$2,198,667.00

**Any line item amount in this Budget may be increased or decreased 10% or less without an amendment to this Agreement being required, so long as the overall amount of the funds obligated under this Agreement is not increased.*

Funding Summary

Federal Share:	\$644,250.00	(22.661583%)
Local Share:	\$2,198,667.00	(77.338417%)
Total Project Cost:	\$2,842,917.00	(100.0%)

Attachment B
Program Statutes and Regulations

The parties to this Agreement and the Hazard Mitigation Grant Program (HMGP) are generally governed by the following statutes and regulations:

- (1) The Robert T. Stafford Disaster Relief and Emergency Assistance Act;
- (2) 44 CFR Parts 7, 9, 10, 13, 14, 17, 18, 25, 206, 220, and 221, and any other applicable FEMA policy memoranda and guidance documents;
- (3) State of Florida Administrative Plan for the Hazard Mitigation Grant Program;
- (4) Hazard Mitigation Assistance Guidance- February 27, 2015 Update; and
- (5) All applicable laws and regulations delineated in Attachment C of this Agreement.

In addition to the above statutes and regulations, the Sub-recipient must comply with the following:

The Sub-recipient shall fully perform the approved hazard mitigation project, as described in the Application and Attachment A (Budget and Scope of Work) attached to this Agreement, in accordance with approved scope of work indicated therein, the estimate of costs indicated therein, the allocation of funds indicated therein, and the terms and conditions of this Agreement. The Sub-recipient shall not deviate from the approved project and the terms and conditions of this Agreement. The Sub-recipient shall comply with any and all applicable codes and standards in performing work funded under this Agreement, and shall provide any appropriate maintenance and security for the project.

Any development permit issued by, or development activity undertaken by, the Sub-recipient and any land use permitted by or engaged in by the Sub-recipient, shall be consistent with the local comprehensive plan and land development regulations prepared and adopted pursuant to Chapter 163, Part II, Florida Statutes. Funds shall be expended for, and development activities and land uses authorized for, only those uses which are permitted under the comprehensive plan and land development regulations. The Sub-recipient shall be responsible for ensuring that any development permit issued and any development activity or land use undertaken is, where applicable, also authorized by the Water Management District, the Florida Department of Environmental Protection, the Florida Department of Health, the Florida Game and Fish Commission, and any Federal, State, or local environmental or land use permitting authority, where required. The Sub-recipient agrees that any repair or construction shall be in accordance with applicable standards of safety, decency, and sanitation, and in conformity with applicable codes, specifications and standards.

The Sub-recipient will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the completed work conforms with the approved plans and specifications and will furnish progress reports and such other information to HMGP as may be required.

If the hazard mitigation project described in Attachment A includes an acquisition or relocation project, then the Sub-recipient shall ensure that, as a condition of funding under this Agreement, the owner of the affected real property shall record in the public records of the county where it is located the following covenants and restrictions, which shall run with and apply to any property acquired, accepted, or from which a structure will be removed pursuant to the project.

- (1) The property will be dedicated and maintained in perpetuity for a use that is compatible with open space, recreational, or wetlands management practices;

- (2) No new structure will be erected on property other than:
 - a. a public facility that is open on all sides and functionally related to a designed open space;
 - b. a restroom; or
- (3) A structure that the Director of the Federal Emergency Management Agency approves in writing before the commencement of the construction of the structure;
- (4) After the date of the acquisition or relocation no application for disaster assistance for any purpose will be made to any Federal entity and no disaster assistance will be provided for the property by any Federal source; and
- (5) If any of these covenants and restrictions is violated by the owner or by some third party with the knowledge of the owner, fee simple title to the Property described herein shall be conveyed to the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida without further notice to the owner, its successors and assigns, and the owner, its successors and assigns shall forfeit all right, title and interest in and to the property.

HMGP Contract Manager will evaluate requests for cost overruns and submit to the regional Director written determination of cost overrun eligibility. Cost overruns shall meet Federal regulations set forth in 44 CFR 206.438(b).

The National Environmental Policy Act (NEPA) stipulates that additions or amendments to a HMGP Sub-Recipient Scope of Work (SOW) shall be reviewed by all State and Federal agencies participating in the NEPA process.

As a reminder, the Sub-recipient must obtain prior approval from the State, before implementing changes to the approved project Scope of Work (SOW). Per the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments:

- (1) For Construction projects, the grantee must "obtain prior written approval for any budget revision which result in a need for additional funds" (44 CFR 13(c));
- (2) A change in the Scope of Work must be approved by FEMA in advance regardless of the budget implications; and
- (3) The Sub-recipient must notify the State as soon as significant developments become known, such as delays or adverse conditions that might raise costs or delay completion, or favorable conditions allowing lower cost or earlier completion. Any extensions of the period of performance must be submitted to FEMA sixty days prior to the project expiration date.

The Sub-recipient assures that it will comply with the following statutes and regulations to the extent applicable:

- (1) 53 Federal Register 8034
- (2) Federal Acquisition Regulations 31.2
- (3) Section 1352, Title 31, US Code
- (4) Chapter 473, Florida Statutes
- (5) Chapter 215, Florida Statutes
- (6) Section 768.28, Florida Statutes
- (7) Chapter 119, Florida Statutes
- (8) Section 216.181(6), Florida Statutes
- (9) Cash Management Improvement Act of 1990
- (10) American with Disabilities Act
- (11) Section 112.061, Florida Statutes
- (12) Immigration and Nationality Act
- (13) Section 286.011, Florida Statutes

- (14) 2 CFR, Part 200 – Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards
- (15) Uniform Relocation Assistance and Real Property Acquisitions Act of 1970
- (16) Title I of the Omnibus Crime Control and Safe Streets Act of 1968
- (17) Juvenile Justice and Delinquency Prevention Act, or the Victims of Crime Act
- (18) Omnibus Crime Control and Safe Streets Act of 1968, as amended
- (19) Victims of Crime Act (as appropriate)
- (20) Section 504 of the Rehabilitation Act of 1973, as amended
- (21) Subtitle A, Title II of the Americans with Disabilities Act (ADA) (1990)
- (22) Department of Justice regulations on disability discrimination, 28 CFR, Part 35 and Part 39
- (23) 42 U.S.C. 5154a

Attachment C

Statement of Assurances

To the extent the following provisions apply to this Agreement, the Sub-recipient certifies that:

- (a) It possesses legal authority to enter into this Agreement and to carry out the proposed program;
- (b) Its governing body has duly adopted or passed as an official act of resolution, motion or similar action authorizing the execution of the hazard mitigation agreement with the Division of Emergency Management (DEM), including all understandings and assurances contained in it, and directing and authorizing the Sub-recipient's chief administrative officer or designee to act in connection with the application and to provide such additional information as may be required;
- (c) No member of or delegate to the Congress of the United States, and no Resident Commissioner, shall receive any share or part of this Agreement or any benefit. No member, officer, or employee of the Sub-recipient or its designees or agents, no member of the governing body of the locality in which this program is situated, and no other public official of the locality or localities who exercises any functions or responsibilities with respect to the program during his tenure or for one year after, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds, for work to be performed in connection with the program assisted under this Agreement. The Sub-recipient shall incorporate, in all contracts or subcontracts a provision prohibiting any interest pursuant to the purpose stated above;
- (d) All Sub-recipient contracts for which the State Legislature is in any part a funding source, shall contain language to provide for termination with reasonable costs to be paid by the Sub-recipient for eligible contract work completed prior to the date the notice of suspension of funding was received by the Sub-recipient. Any cost incurred after a notice of suspension or termination is received by the Sub-recipient may not be funded with funds provided under this Agreement unless previously approved in writing by the Division. All Sub-recipient contracts shall contain provisions for termination for cause or convenience and shall provide for the method of payment in such event;
- (e) It will comply with:
 - (1) Contract Work Hours and Safety Standards Act of 1962, 40 U.S.C. 327 et seq., requiring that mechanics and laborers (including watchmen and guards) employed on federally assisted contracts be paid wages of not less than one and one-half times their basic wage rates for all hours worked in excess of forty hours in a work week; and
 - (2) Federal Fair Labor Standards Act, 29 U.S.C. Section 201 et seq., requiring that covered employees be paid at least minimum prescribed wage, and also that they be paid one and one-half times their basic wage rates for all hours worked in excess of the prescribed work-week.
- (f) It will comply with
 - (1) Title VI of the Civil Rights Act of 1964 (P.L. 88-352), and the regulations issued pursuant thereto, which provides that no person in the United States shall on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Sub-recipient received Federal financial assistance and will immediately take any measures necessary to effectuate this assurance. If any real property or structure thereon is provided or improved with the aid of Federal financial assistance extended to the Sub-recipient, this assurance shall obligate the Sub-recipient, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is

used for a purpose for which the Federal financial assistance is extended, or for another purpose involving the provision of similar services or benefits;

- (2) Any prohibition against discrimination on the basis of age under the Age Discrimination Act of 1975, as amended (42 U.S.C. 6101-6107) which prohibits discrimination on the basis of age or with respect to otherwise qualifies handicapped individuals as provided in Section 504 of the Rehabilitation Act of 1973;
 - (3) Executive Order 11246, as amended by Executive Orders 11375 and 12086, and the regulations issued pursuant thereto, which provide that no person shall be discriminated against on the basis of race, color, religion, sex or national origin in all phases of employment during the performance of federal or federally assisted construction contracts; affirmative action to insure fair treatment in employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff/termination, rates of pay or other forms of compensation; and election for training and apprenticeship;
- (g) It will establish safeguards to prohibit employees from using positions for a purpose that is or gives the appearance of being motivated by a desire for private gain for themselves or others, particularly those with whom they have family, business, or other ties pursuant to Section 112.313 and Section 112.3135, Florida Statutes;
 - (h) It will comply with the Anti-Kickback Act of 1986, 41 U.S.C. Section 51 which outlaws and prescribes penalties for "kickbacks" of wages in federally financed or assisted construction activities;
 - (i) It will comply with the provisions of 18 U.S.C. 594, 598, 600-605 (further known as the Hatch Act) which limits the political activities of employees;
 - (j) It will comply with the flood insurance purchase and other requirements of the Flood Disaster Protection Act of 1973, as amended, 42 U.S.C. 4002-4107, including requirements regarding the purchase of flood insurance in communities where such insurance is available as a condition for the receipt of any Federal financial assistance for construction or acquisition purposes for use in any area having special flood hazards. The phrase "Federal financial assistance" includes any form of loan, grant, guaranty, insurance payment, rebate, subsidy, disaster assistance loan or grant, or any other form of direct or indirect Federal assistance;

For sites located within Special Flood Hazard Areas (SFHA), the Sub-recipient must include a FEMA Model Acknowledgement of Conditions of Mitigation of Property in a Special Flood Hazard Area with FEMA Grant Funds executed by the title holder with the closeout request verifying that certain SFHA requirements were satisfied on each of the properties. The Model Acknowledgement can be found at www.fema.gov/government/grant/sfha_conditions.shtml

- (k) It will require every building or facility (other than a privately owned residential structure) designed, constructed, or altered with funds provided under this Agreement to comply with the "Uniform Federal Accessibility Standards," (AS) which is Appendix A to 41 CFR Section 101-19.6 for general type buildings and Appendix A to 24 CFR, Part 40 for residential structures. The Sub-recipient will be responsible for conducting inspections to ensure compliance with these specifications by the contractor;
- (l) It will, in connection with its performance of environmental assessments under the National Environmental Policy Act of 1969, comply with Section 106 of the National Historic Preservation Act of 1966 (U.S.C. 470), Executive Order 11593, 24 CFR, Part 800, and the Preservation of Archaeological and Historical Data Act of 1966 (16 U.S.C. 469a-1, et seq.) by:
 - (1) Consulting with the State Historic Preservation Office to identify properties listed in or eligible for inclusion in the National Register of Historic Places that are subject to adverse effects (see 36 CFR, Section 800.8) by the proposed activity; and

- (2) Complying with all requirements established by the State to avoid or mitigate adverse effects upon such properties.
- (3) Abiding by the terms and conditions of the “**Programmatic Agreement Among the Federal Emergency Management Agency, the Florida State Historic Preservation Office, the Florida Division of Emergency Management and the Advisory Council on Historic Preservation, (PA)**” which addresses roles and responsibilities of Federal and State entities in implementing Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. 470(f), and implementing regulations in 36 CFR, Part 800.
- (4) When any of the Sub-recipient's projects funded under this Agreement may affect a historic property, as defined in 36 CFR, Part 800 (2)(e), the Federal Emergency Management Agency (FEMA) may require the Sub-recipient to review the eligible scope of work in consultation with the State Historic Preservation Office (SHPO) and suggest methods of repair or construction that will conform with the recommended approaches set out in the **Secretary of Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings 1992 (Standards)**, the **Secretary of the Interior's Guidelines for Archeological Documentation (Guidelines)** (48 Federal Register 44734-37), or any other applicable Secretary of Interior standards. If FEMA determines that the eligible scope of work will not conform with the **Standards**, the Sub-recipient agrees to participate in consultations to develop, and after execution by all parties, to abide by, a written agreement that establishes mitigation and recondition measures, including but not limited to, impacts to archeological sites, and the salvage, storage, and reuse of any significant architectural features that may otherwise be demolished.
- (5) The Sub-recipient agrees to notify FEMA and the Division if any project funded under this Agreement will involve ground disturbing activities, including, but not limited to: subsurface disturbance; removal of trees; excavation of footings and foundations, and installation of utilities (such as water, sewer, storm drains, electrical, gas, leach lines and septic tanks) except where these activities are restricted solely to areas previously disturbed by the installation, replacement or maintenance of such utilities. FEMA will request the SHPO's opinion on the potential that archeological properties may be present and be affected by such activities. The SHPO will advise the Sub-recipient on any feasible steps to be accomplished to avoid any National Register eligible archeological property or will make recommendations for the development of a treatment plan for the recovery or archeological data from the property.

If the Sub-recipient is unable to avoid the archeological property, develop, in consultation with SHPO, a treatment plan consistent with the **Guidelines** and take into account the Advisory Council on Historic Preservation (Council) publication “Treatment of Archeological Properties”. The Sub-recipient shall forward information regarding the treatment plan to FEMA, the SHPO and the Council for review. If the SHPO and the Council do not object within 15 calendar days of receipt of the treatment plan, FEMA may direct the Sub-recipient to implement the treatment plan. If either the Council or the SHPO object, Sub-recipient shall not proceed with the project until the objection is resolved.

- (6) The Sub-recipient shall notify the Division and FEMA as soon as practicable: (a) of any changes in the approved scope of work for a National Register eligible or listed property; (b) of all changes to a project that may result in a supplemental DSR or modify a HMGP project for a National Register eligible or listed property; (c) if it appears that a project funded under this Agreement will affect a previously unidentified property that may be eligible for inclusion in the National Register or affect a known historic property in an unanticipated manner. The Sub-recipient acknowledges that FEMA may require the Sub-recipient to stop construction in the vicinity of the discovery of a previously unidentified property that may eligible for inclusion in the National Register or upon learning that construction may affect a known historic property in an unanticipated manner. The Sub-recipient further acknowledges that FEMA may require the Sub-recipient to take all

reasonable measures to avoid or minimize harm to such property until FEMA concludes consultation with the SHPO. The Sub-recipient also acknowledges that FEMA will require, and the Sub-recipient shall comply with, modifications to the project scope of work necessary to implement recommendations to address the project and the property.

- (7) The Sub-recipient acknowledges that, unless FEMA specifically stipulates otherwise, it shall not receive funding for projects when, with intent to avoid the requirements of the PA or the NHPA, the Sub-recipient intentionally and significantly adversely affects a historic property, or having the legal power to prevent it, allowed such significant adverse effect to occur.
- (m) It will comply with Title IX of the Education Amendments of 1972, as amended (20 U.S.C. 1681-1683 and 1685-1686) which prohibits discrimination on the basis of sex;
- (n) It will comply with the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, (42 U.S.C. 4521-45-94) relating to nondiscrimination on the basis of alcohol abuse or alcoholism;
- (o) It will comply with 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records;
- (p) It will comply with Lead-Based Paint Poison Prevention Act (42 U.S.C. 4821 et seq.) which prohibits the use of lead based paint in construction of rehabilitation or residential structures;
- (q) It will comply with the Energy Policy and Conservation Act (P.L. 94-163; 42 U.S.C. 6201-6422), and the provisions of the State Energy Conservation Plan adopted pursuant thereto;
- (r) It will comply with the Laboratory Animal Welfare Act of 1966, (7 U.S.C. 2131-2159), pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by an award of assistance under this Agreement;
- (s) It will comply with Title VIII of the Civil Rights Act of 1968, (42 U.S.C 2000c and 42 U.S.C. 3601-3619), as amended, relating to non-discrimination in the sale, rental, or financing of housing, and Title VI of the Civil Rights Act of 1964 (P.L. 88-352), which prohibits discrimination on the basis of race, color or national origin;
- (t) It will comply with the Clean Air Act of 1955, as amended, 42 U.S.C. 7401-7642;
- (u) It will comply with the Clean Water Act of 1977, as amended, 42 U.S.C. 7419-7626
- (v) It will comply with the endangered Species Act of 1973, 16 U.S.C. 1531-1544;
- (w) It will comply with the Intergovernmental Personnel Act of 1970, 42 U.S.C. 4728-4763;
- (x) It will assist the awarding agency in assuring compliance with the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 270;
- (y) It will comply with environmental standards which may be prescribed pursuant to the National Environmental Policy Act of 1969, 42 U.S.C. 4321-4347;
- (z) It will assist the awarding agency in assuring compliance with the Preservation of Archeological and Historical Preservation Act of 1966, 16 U.S.C. 469a, et seq.;
- (aa) It will comply with the Rehabilitation Act of 1973, Section 504, 29 U.S.C. 794, regarding non-discrimination;

- (bb) It will comply with the environmental standards which may be prescribed pursuant to the Safe Drinking Water Act of 1974, 42 U.S.C. 300f-300j, regarding the protection of underground water sources;
- (cc) It will comply with the requirements of Titles II and III of the Uniform Relocation Assistance and Property Acquisition Policies Act of 1970, 42 U.S.C. 4621-4638, which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or Federally assisted programs;
- (dd) It will comply with the Wild and Scenic Rivers Act of 1968, 16 U.S.C. 1271-1287, related to protecting components or potential components of the national wild and scenic rivers system;
- (ee) It will comply with the following Executive Orders: EO 11514 (NEPA); EO 11738 (violating facilities); EO 11988 (Floodplain Management); EO 11990 (Wetlands); and EO 12898 (Environmental Justice);
- (ff) It will comply with the Coastal Barrier Resources Act of 1977, 16 U.S.C. 3510;
- (gg) It will assure project consistency with the approved State program developed under the Coastal Zone Management Act of 1972, 16 U.S.C. 1451-1464; and
- (hh) It will comply with the Fish and Wildlife Coordination Act of 1958, 16 U.S.C. 661-666.
- (ii) With respect to demolition activities, it will:
 - (1) Create and make available documentation sufficient to demonstrate that the Sub-recipient and its demolition contractor have sufficient manpower and equipment to comply with the obligations as outlined in this Agreement.
 - (2) Return the property to its natural state as though no improvements had ever been contained thereon.
 - (3) Furnish documentation of all qualified personnel, licenses and all equipment necessary to inspect buildings located in the Sub-recipient's jurisdiction to detect the presence of asbestos and lead in accordance with requirements of the U.S. Environmental Protection Agency, the Florida Department of Environmental Protection and the County Health Department.
 - (4) Provide documentation of the inspection results for each structure to indicate:
 - a. Safety Hazard Present
 - b. Health Hazards Present
 - c. Hazardous Materials Present
 - (5) Provide supervision over contractors or employees employed by the Sub-recipient to remove asbestos and lead from demolished or otherwise applicable structures.
 - (6) Leave the demolished site clean, level and free of debris.
 - (7) Notify the Division promptly of any unusual existing condition which hampers the contractor's work.
 - (8) Obtain all required permits.
 - (9) Provide addresses and marked maps for each site where water wells and septic tanks are to be closed along with the number of wells and septic tanks located on each site. Provide documentation of closures.
 - (10) Comply with mandatory standards and policies relating to energy efficiency which are contained in the State Energy Conservation Plan issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163).

- (11) Comply with all applicable standards, orders, or requirements issued under Section 112 and 306 of the Clean Air Act (42 U.S.C. 1857h), Section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and the U.S. Environmental Protection Agency regulations (40 CFR, Part 15 and 61). This clause shall be added to any subcontracts.
- (12) Provide documentation of public notices for demolition activities.

Attachment D

DIVISION OF EMERGENCY MANAGEMENT

**REQUEST FOR ADVANCE OR REIMBURSEMENT OF
HAZARD MITIGATION ASSISTANCE PROGRAM FUNDS**

SUB-RECIPIENT: City of Port Orange

REMIT ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

PROJECT TYPE: Drainage Improvement PROJECT #: 4283-86-R

PROGRAM: Hazard Mitigation Grant Program CONTRACT #: H0112

APPROVED BUDGET: _____ FEDERAL SHARE: _____ MATCH: _____

ADVANCED RECEIVED: _____ N/A _____ AMOUNT: _____ SETTLED? _____

Invoice Period: _____ To _____ Payment #: _____

Eligible Amount 100% (Current Request)	Obligated Federal Amount 22.661583%	Obligated Non- Federal 77.338417%	Division Use Only	
			Approved	Comments

TOTAL CURRENT REQUEST: \$ _____

By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and objectives set forth in the terms and conditions of the Federal award. I am aware that any false, fictitious, or fraudulent information, or the omission of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (U.S. Code Title 18, Section 1001 and Title 31, Sections 3729-3730 and 3801-3812.

SUB-RECIPIENT SIGNATURE: _____

NAME / TITLE: _____ DATE: _____

TO BE COMPLETED BY THE DIVISION	
APPROVED PROJECT TOTAL	\$ _____
ADMINISTRATIVE COST	\$ _____
APPROVED FOR PAYMENT	\$ _____
GOVERNOR'S AUTHORIZED REPRESENTATIVE DATE	

**SUMMARY OF DOCUMENTATION IN SUPPORT OF AMOUNT
CLAIMED FOR ELIGIBLE DISASTER WORK UNDER THE
HAZARD MITIGATION ASSISTANCE PROGRAM**

SUB-RECIPIENT: City of Port Orange PAYMENT #: _____
PROJECT TYPE: Drainage Improvement PROJECT #: 4283-86-R
PROGRAM: Hazard Mitigation Grant Program CONTRACT #: H0112

	REF NO ²	DATE ³	DOCUMENTATION ⁴	(Check) AMOUNT	ELIGIBLE COSTS (100%)
1					
2					
3					
4					
5					
6					
7					
8					
9					
This payment represents % completion of the project. TOTAL					

² Recipient's internal reference number (e.g., Invoice, Receipt, Warrant, Voucher, Claim Check, or Schedule #)

³ Date of delivery of articles, completion of work or performance services. (per document)

⁴ List Documentation (Recipient's payroll, material out of recipient's stock, recipient owned equipment and name of vendor or contractor) by category (Materials, Labor, Fees) and line item in the approved project line item budget. Provide a brief description of the articles or services. List service dates per each invoice.

**Attachment E
JUSTIFICATION OF ADVANCE PAYMENT**

SUB-RECIPIENT: City of Port Orange

If you are requesting an advance, indicate same by checking the box below.

☐ **ADVANCE REQUESTED**

Advance payment of \$ _____ is requested. Balance of payments will be made on a reimbursement basis. These funds are needed to pay staff, award benefits to clients, duplicate forms and purchase start-up supplies and equipment. We would not be able to operate the program without this advance.

If you are requesting an advance, complete the following chart and line item justification below.

PLEASE NOTE: Calculate your estimated expenses at 100% of your expected needs for 90 days.

Submit Attachment D with the cost share breakdown along with Attachment E and all supporting documentation.

ESTIMATED EXPENSES

BUDGET CATEGORY/LINE ITEMS (list applicable line items)	20____-20____ Anticipated Expenditures for First Three Months of Contract
<u>For example</u> ADMINISTRATIVE COSTS (Include Secondary Administration.)	
<u>For example</u> PROGRAM EXPENSES	
TOTAL EXPENSES	

LINE ITEM JUSTIFICATION (For each line item, provide a detailed justification explaining the need for the cash advance. The justification must include supporting documentation that clearly shows the advance will be expended within the first ninety (90) days of the contract term. Support documentation should include quotes for purchases, delivery timelines, salary and expense projections, etc. to provide the Division reasonable and necessary support that the advance will be expended within the first ninety (90) days of the contract term. Any advance funds not expended within the first ninety (90) days of the contract term as evidenced by copies of invoices and cancelled checks as required by the Budget and Scope of work showing 100% of expenditures for the 90 day period shall be returned to the Division Cashier, 2555 Shumard Oak Boulevard, Tallahassee, Florida 32399, within thirty (30) days of receipt, along with any interest earned on the advance.

Attachment F

DIVISION OF EMERGENCY MANAGEMENT
HAZARD MITIGATION GRANT PROGRAM
QUARTERLY REPORT FORM

Instructions: Complete and submit this form to the appropriate Project Manager within 15 days of each quarter's end date.

SUB-RECIPIENT: City of Port Orange PROJECT #: 4283-86-R
PROJECT TYPE: Drainage Improvement CONTRACT #: H0112
PROGRAM: Hazard Mitigation Grant Program QUARTER ENDING: _____

Advance Payment Information:

Advance Received ☐ N/A ☐ Amount: \$ _____ Advance Settled? Yes ☐ No ☐

Provide reimbursement **Projections** for this project (*projections may change*):

Jul-Sep 20__ \$ _____ Oct-Dec 20__ \$ _____ Jan-Mar 20__ \$ _____ Apr-Jun 20__ \$ _____

Target Dates:

Contract Initiation Date: _____ Contract Expiration Date: _____

Estimated Project Completion Date: _____

Project Proceeding on **Schedule**? ☐ Yes ☐ No (*If No, please describe under **Issues** below*)

Percentage of Work Completed (*may be confirmed by state inspectors*): _____ %

Describe **Milestones** achieved during this quarter:

Provide a **Schedule** for the remainder of work to project completion: (*Milestones from Contract with estimated dates*)

<u>Milestone</u>	<u>Date</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Describe **Issues** or circumstances affecting completion date, milestones, scope of work, and/or cost:

Cost Status: ☐ Cost Unchanged ☐ Under Budget ☐ Over Budget

Additional **Comments**/Elaboration:

NOTE: Division of Emergency Management (DEM) staff may perform interim inspections and/or audits at any time. Events may occur between quarterly reports, which have significant impact upon your project(s), such as anticipated overruns, changes in scope of work, etc. Please contact the Division as soon as these conditions become known, otherwise you may be found non-compliant with your sub grant award.

Person Completing Form: _____

Phone: _____

~ To be completed by Division staff ~

Date Reviewed: _____ Reviewer: _____

Actions: _____

Attachment G
Warranties and Representations

Financial Management

The Sub-Recipient's financial management system must comply with 2 C.F.R. §200.302.

Procurements

Any procurement undertaken with funds authorized by this Agreement must comply with the requirements of 2 C.F.R. §200, Part D—Post Federal Award Requirements—Procurement Standards (2 C.F.R. §§200.317 through 200.326).

Business Hours

The Sub-Recipient shall have its offices open for business, with the entrance door open to the public, and at least one employee on site, from: **8:00 AM - 5:00 PM, Monday Thru Friday, as applicable.**

Licensing and Permitting

All subcontractors or employees hired by the Sub-Recipient shall have all current licenses and permits required for all of the particular work for which they are hired by the Sub-Recipient.

Attachment H

Certification Regarding Debarment, Suspension, Ineligibility And Voluntary Exclusion

Subcontractor Covered Transactions

- (1) The prospective subcontractor, _____, of the Sub-Recipient certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the Sub-Recipient's subcontractor is unable to certify to the above statement, the prospective subcontractor shall attach an explanation to this form.

SUBCONTRACTOR

By: _____
Signature

Name and Title

Street Address

City, State, Zip

Date

City of Port Orange
Sub-Recipient's Name

H0112
DEM Contract Number

4283-86-R
FEMA Project Number

Attachment I
Federal Funding Accountability and Transparency Act
Instructions and Worksheet

PURPOSE: The Federal Funding Accountability and Transparency Act (FFATA) was signed on September 26, 2006. The intent of this legislation is to empower every American with the ability to hold the government accountable for each spending decision. The FFATA legislation requires information on federal awards (federal assistance and expenditures) be made available to the public via a single, searchable website, which is <http://www.usaspending.gov/>.

The FFATA Sub-award Reporting System (FSRS) is the reporting tool the Florida Division of Emergency Management ("FDEM" or "Division") must use to capture and report sub-award and executive compensation data regarding first-tier sub-awards that obligate \$25,000 or more in Federal funds (excluding Recovery funds as defined in section 1512(a) (2) of the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5).

Note: This "Instructions and Worksheet" is meant to explain the requirements of the FFATA and give clarity to the FFATA Form distributed to sub-awardees for completion. All pertinent information below should be filled out, signed, and returned to the project manager.

ORGANIZATION AND PROJECT INFORMATION

The following information must be provided to the FDEM prior to the FDEM's issuance of a sub-award (Agreement) that obligates \$25,000 or more in federal funds as described above. Please provide the following information and return the signed form to the Division as requested.

PROJECT #: 4283-86-R
FUNDING AGENCY: Federal Emergency Management Agency
AWARD AMOUNT: \$644,250.00
OBLIGATION/ACTION DATE: August 20, 2018
SUBAWARD DATE (if applicable): _____

DUNS#: 835509878
DUNS# +4: _____

*If your company or organization does not have a DUNS number, you will need to obtain one from Dun & Bradstreet at 866-705-5711 or use the web form (<http://fedgov.dnb.com/webform>). The process to request a DUNS number takes about ten minutes and is free of charge.

BUSINESS NAME: City of Port Orange
DBA NAME (IF APPLICABLE): _____
PRINCIPAL PLACE OF BUSINESS ADDRESS: _____
ADDRESS LINE 1: 1000 City Center Circle
ADDRESS LINE 2: _____
ADDRESS LINE 3: _____
CITY Port Orange STATE FL ZIP CODE+4** 32129
PARENT COMPANY DUNS# (if applicable): 080827082
CATALOG OF FEDERAL DOMESTIC ASSISTANCE (CFDA#): 97.039
DESCRIPTION OF PROJECT (Up to 4000 Characters)

As a Hazard Mitigation Grant Program project, the Sub-Recipient proposes to improve the drainage of Virginia Avenue (intersection of Grant Street), and Monroe Street, Port Orange, 32127.

The Construction scope of work proposes drainage improvements of intersection of Grant Street and Virginia Avenue. The proposed project shall include construction of a pump station, storm water ponds, installation of force main at Monroe Place and Fox Place, inlets and pipes to properly connect project area to proposed ponds. Construction of storm water pond and force main in proposed area would require acquiring land, moving any disturbed utilities and directional drilling along Fox Place. The proposed force main and diesel driven pumps would be raised 1-foot above Base Flood Elevation (BFE) and capable to remove floodwaters out of low laying area, which is prone to standing water.

The project shall provide protection against a 25-year storm event. Activities shall be completed in strict compliance with Federal, State and Local applicable Rules and Regulations.

Project Location:

Proposed project starts approximately 50-feet west of Grant Street and Virginia Avenue, continues along Grant Street to the east; north side of the project - approx. 50 feet north of intersection of Virginia Avenue and Church Street. South side of the project approximately 100-feet south of intersection of Fox Place and Jefferson Avenue. The project ends 100-feet east of intersection of Riverside Drive and Meeker Place. Project Boundary Coordinates: (29.14245535, -80.99239573); (29.14358136, -80.98528882); (29.13402634, -80.98843858); (29.13609736, -80.98159858). Pond A (29.13790999, -80.98521282); Pond B (29.13793748, -80.98557605).

PRINCIPAL PLACE OF PROJECT PERFORMANCE (IF DIFFERENT THAN PRINCIPAL PLACE OF BUSINESS):

Vicinity of Virginia Avenue and Monroe Street
ADDRESS LINE 1: _____
ADDRESS LINE 2: _____
ADDRESS LINE 3: _____
CITY Port Orange STATE FL ZIP CODE+4** 32127

CONGRESSIONAL DISTRICT FOR PRINCIPAL PLACE OF PROJECT PERFORMANCE: FL-6

****Providing the Zip+4 ensures that the correct Congressional District is reported.**

EXECUTIVE COMPENSATION INFORMATION:

1. In your business or organization's previous fiscal year, did your business or organization (including parent organization, all branches, and all affiliates worldwide) receive (a) 80 percent or more of your annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance (e.g. loans, grants, subgrants, and/or cooperative agreements, etc.) subject to the Transparency Act, as defined at 2 CFR 170.320; , (b) \$25,000,000 or more in annual gross revenues from U.S. Federal procurement contracts (and subcontracts) and Federal financial assistance (e.g. loans, grants, subgrants, and/or cooperative agreements, etc.) subject to the Transparency Act?

Yes ☐ No ☒

If the answer to Question 1 is "Yes," continue to Question 2. If the answer to Question 1 is "No", move to the signature block below to complete the certification and submittal process.

2. Does the public have access to information about the compensation of the executives in your business or organization (including parent organization, all branches, and all affiliates worldwide) through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) Section 6104 of the Internal Revenue Code of 1986?

Yes ☐ No ☐

If the answer to Question 2 is "Yes," move to the signature block below to complete the certification and submittal process. [Note: Securities Exchange Commission information should be accessible at <http://www.sec.gov/answers/excomp.htm>. Requests for Internal Revenue Service (IRS) information should be directed to the local IRS for further assistance.]

If the answer to Question 2 is "No" FFATA reporting is required. Provide the information required in the "TOTAL COMPENSATION CHART FOR MOST RECENTLY COMPLETED FISCAL YEAR" appearing below to report the "Total Compensation" for the five (5) most highly compensated "Executives", in rank order, in your organization. For purposes of this request, the following terms apply as defined in 2 CFR Ch. 1 Part 170 Appendix A:

"Executive" is defined as "officers, managing partners, or other employees in management positions".

"Total Compensation" is defined as the cash and noncash dollar value earned by the executive during the most recently completed fiscal year and includes the following:

- i. Salary and bonus.
- ii. Awards of stock, stock options, and stock appreciation rights. Use the dollar amount recognized for financial statement reporting purposes with respect to the fiscal year in accordance with the Statement of Financial Accounting Standards No. 123 (Revised 2004) (FAS 123R), Shared Based Payments.
- iii. Earnings for services under non-equity incentive plans. This does not include group life, health, hospitalization or medical reimbursement plans that do not discriminate in favor of executives, and are available generally to all salaried employees.
- iv. Change in pension value. This is the change in present value of defined benefit and actuarial pension plans.
- v. Above-market earnings on deferred compensation which is not tax-qualified.

- vi. Other compensation, if the aggregate value of all such other compensation (e.g. severance, termination payments, value of life insurance paid on behalf of the employee, perquisites or property) for the executive exceeds \$10,000.

TOTAL COMPENSATION CHART FOR MOST RECENTLY COMPLETED FISCAL YEAR

(Date of Fiscal Year Completion _____)

Rank (Highest to Lowest)	Name (Last, First, MI)	Title	Total Compensation for Most Recently Completed Fiscal Year
1			
2			
3			
4			
5			

THE UNDERSIGNED CERTIFIES THAT ON THE DATE WRITTEN BELOW, THE INFORMATION PROVIDED HEREIN IS ACCURATE.

SIGNATURE: _____

NAME AND TITLE: Donald O. Burnette, City Mayor

DATE: October 16, 2018

Attachment J
Mandatory Contract Provisions

Provisions:

Any contract or subcontract funded by this Agreement must contain the applicable provisions outlined in Appendix II to 2 C.F.R. Part 200. It is the responsibility of the sub-recipient to include the required provisions. The Division provides the following list of sample provisions that may be required:

(D) Davis-Bacon Act, as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of \$2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland "Anti-Kickback" Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

(E) Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3701 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or

materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

(F) Rights to Inventions Made Under a Contract or Agreement. If the Federal award meets the definition of "funding agreement" under 37 CFR §401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

(G) Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended—Contracts and subgrants of amounts in excess of \$100,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

(H) Mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201).

(I) Debarment and Suspension (Executive Orders 12549 and 12689)—A contract award (see 2 CFR 101.220) must not be made to parties listed on the governmentwide Excluded Parties List System in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 189 that implement Executive Orders 12549 (3 CFR Part 1996 Comp., p. 109) and 12689 (3 CFR Part 1989 Comp., p. 235), "Debarment and Suspension." The Excluded Parties List System in SAM contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

(J) Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)—Contractors that apply or bid for an award of \$100,000 or more must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any

other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

(K) See §200.322 Procurement of recovered materials.

APPENDIX III TO PART 200—INDIRECT (F&A) COSTS IDENTIFICATION AND ASSIGNMENT, AND RATE DETERMINATION FOR INSTITUTIONS OF HIGHER EDUCATION (IHEs)

A. GENERAL.

This appendix provides criteria for identifying and computing indirect (or indirect (F&A)) rates at IHEs (institutions). Indirect (F&A) costs are those that are incurred for common or joint objectives and therefore cannot be identified readily and specifically with a particular sponsored project, an instructional activity, or any other institutional activity. See subsection B.1, Definition of Facilities and Administration, for a discussion of the components of indirect (F&A) costs.

1. Major Functions of an Institution

Refers to instruction, organized research, other sponsored activities and other institutional activities as defined in this section:

a. *Instruction* means the teaching and training activities of an institution. Except for research training as provided in subsection b, this term includes all teaching and training activities, whether they are offered for credits toward a degree or certificate or on a non-credit basis, and whether they are offered through regular academic departments or separate divisions, such as a summer school division or an extension division. Also considered part of this major function are departmental research, and, where agreed to, university research.

(1) *Sponsored instruction and training* means specific instructional or training activity established by grant, contract, or cooperative agreement. For purposes of the cost principles, this activity may be considered a major function even though an institution's accounting treatment may include it in the instruction function.

(2) *Departmental research* means research, development and scholarly activities that are not organized research and, consequently, are not separately budgeted and accounted for. Departmental research, for purposes of this document, is not considered as a major function, but as a part of the instruction function of the institution.

b. *Organized research* means all research and development activities of an institution that are separately budgeted and accounted for. It includes:

(1) *Sponsored research* means all research and development activities that are sponsored by Federal and non-Federal agencies and organizations. This term includes activities involving the training of individuals in research techniques (commonly called research training) where such activities utilize the same facilities as other research and development activities and where such activities are not included in the instruction function.

(2) *University research* means all research and development activities that are separately budgeted and accounted for by the institution under an internal application of institutional funds. University research, for purposes of this document, must be combined with sponsored research under the function of organized research.

c. *Other sponsored activities* means programs and projects financed by Federal and non-Federal agencies and organizations which involve the performance of work other than instruction and organized research. Examples of such programs and projects are health service projects and community service programs. However, when any of these activities are undertaken by the institution without outside support, they may be classified as other institutional activities.

d. *Other institutional activities* means all activities of an institution except for instruction, departmental research, organized research, and other sponsored activities, as defined in this section: indirect (F&A) cost activities identified in this Appendix paragraph B, Identification and Assignment of indirect (F&A) costs; and specialized services facilities described in §200.469 Specialized service facilities of this Part.

Examples of other institutional activities include operation of residence halls, dining halls, hospitals and clinics, student unions, intercollegiate athletics, bookstores, faculty housing, student apartments, guest houses, chapels, theaters, public museums, and other similar auxiliary enterprises. This definition also includes any other categories of activities, costs of which are "unallowable" to Federal awards, unless otherwise indicated in an award.

2. Criteria for Distribution

a. *Base period.* A base period for distribution of indirect (F&A) costs is the period during which the costs are incurred. The base period normally should coincide with the fiscal year established by the institution, but in any event the base period should be so selected as to avoid inequities in the distribution of costs.

b. *Need for cost groupings.* The overall objective of the indirect (F&A) cost allocation process is to distribute the indirect (F&A) costs described in Section B, Identification and Assignment of Indirect (F&A) costs, to



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 5/18/2021

Consent item: Yes

SUBJECT: (C15) Approval of Agreement with Volusia County Tax Collector for the Utilization of the Uniform Method of Collection of Non-ad Valorem Assessments

DEPARTMENT: Finance

GOAL: 5 - Fiscal Sustainability

RECOMMENDED MOTION: Move to approve Interlocal Agreement with the Volusia County Tax Collector.

SUMMARY: In 2018, the Volusia County voters approved Amendment 10 of the County Charter requiring the creation of an elected Tax Collector position. In November 2020, voters approved Will Roberts as the new Tax Collector. In January 2021, Mr. Rogers began the process of setting up the office. Part of this process included drafting an Interlocal Agreement specifying the Tax Collector's Office rather than the Property Appraiser's Office as the assessment entity.

Attached is the agreement with the Volusia County Tax Collector to collect and process non-Ad Valorem assessments of the City. The collection services have been outsourced as the costs for internal processing would be prohibitive and inefficient. The fees for these services are deducted from the amount owed to the City.

Florida Statute Section 194.3632(2) and Rule 12D-18.004(2) require the City to enter into an Interlocal Agreement for the reimbursement of the necessary administrative costs incurred.

This contract represents continuing services but the per-parcel cost of collection of \$0.55 is now assessed by the Tax Collectors Office whereas previously it was part of the Property Assessors fees.

The total cost of collection for Ad Valorem and Non-Ad Valorem is \$1.32 (\$0.77 for Ad Valorem + \$0.55 for non-Advalorem). There are 22,938 parcels in the City.

These fees are reviewed annually and updated as necessary.

Project No.: n/a

Funding Account No.: 00000000000

Presenter: Scott Neils

ATTACHMENTS:

1.	INTERLOCAL AGREEMENT - Tax Collector - 2021	INTERLOCAL AGREEMENT - Tax Collector - 2021.pdf
2.	Interlocal Agreement - Tax Collector 2017	Interlocal Agreement - Tax Collector 2017.pdf
3.	Port Orange Non Ad Valorem Parcels - Stormwater Fee Collection	PO NAVA.pdf

Scott Neils	Created/Initiated - 4/1/2021
Scott Neils	Approved - 4/1/2021
Lupe Reyna-Coffin	Approved - 4/1/2021
Scott Neils	Approved - 4/2/2021
Matthew Jones	Approved - 4/22/2021
Jamie Miller	Approved - 4/22/2021
Wayne Clark	Approved - 5/7/2021
Robin Fenwick	Final Approval - 5/7/2021

**AGREEMENT WITH VOLUSIA COUNTY TAX COLLECTOR
FOR THE UTILIZATION OF THE UNIFORM METHOD OF COLLECTION
OF NON-AD VALOREM ASSESSMENTS**

This Agreement with Volusia County Tax Collector for the Utilization of the Uniform Method of Collection of Non-Ad Valorem Assessments ("Agreement") is made and entered into by and between City of Port Orange, ("Local Government") a Local Government as such term is defined in § 197.3632, Florida Statutes, and the **Volusia County Tax Collector**.

WHEREAS, the Local Government wants to levy, collect, and enforce its non-ad valorem assessments utilizing the uniform method for the levy, collection, and enforcement of its non-ad valorem assessments, as provided for in §§ 197.3632 and 197.3635, Florida Statutes ("Uniform Method"); and

WHEREAS, pursuant to § 197.3632(2), Florida Statutes, and Rule 12D-18.004(2), Florida Administrative Code, the Local Government must enter into an agreement with the tax collector to provide for the reimbursement of the necessary administrative costs incurred in the utilization of the Uniform Method; and

WHEREAS, Rule 12D-18.004(1)(b), Florida Administrative Code, further requires an agreement between the Local Government and the Tax Collector for the merger of the non-ad valorem assessment roll or rolls with the ad valorem roll to produce one collection roll; and

WHEREAS, Rule 12D-18.004(1)(c), Florida Administrative Code, requires the Local Government to enter into a separate agreement with the Tax Collector for each non-ad valorem assessment roll, and each such agreement must comply with the requirements of Rule 12D-18.004; and

WHEREAS, this Agreement is intended to meet the requirements of both § 197.3632, Florida Statutes, and Rule 12D-18.004, Florida Administrative Code, as such pertain to the Local Government's use of the Uniform Method and the Tax Collector's administrative duties pursuant thereto.

NOW, THEREFORE, in consideration of the agreements, promises, and covenants set forth herein and other good and valuable consideration, the parties agree as follows:

I. General.

1. **Application.** This Agreement shall apply to the use of the Uniform Method for the non-ad valorem assessment(s) identified in the Local Government's duly adopted resolution(s) attached hereto and incorporated herein as **Exhibit A** ("Assessment").

2. **Term.** The term of this Agreement shall commence upon execution by both parties. For the purposes of this Agreement, a tax year shall mean and refer to a calendar year. This Agreement shall remain in effect for subsequent years' assessments and shall terminate (i) automatically once the Assessment is paid in its entirety such that no Assessment amounts need to be assessed or collected in a subsequent year or (ii) as otherwise provided herein or established by law. Pursuant to § 197.3632(6), Florida Statutes, the Local Government may discontinue use of the Uniform Method and terminate this Agreement upon written notice to the Tax Collector, the Property Appraiser, and Florida Department of Revenue before January 10 of each tax year. Such notice, upon the receipt thereof by the other party, shall terminate this Agreement. If notice is submitted after January 10 of the current tax year, then the Agreement shall continue to remain in effect for the current tax year; however, the Agreement shall be terminated with respect to the next tax year [e.g., if notice were sent December 1, 2017 (in tax year 2017), termination would be effective for the 2018 tax year; if notice were sent on January 5, 2018 (in tax year 2018), termination would be effective for the 2018 tax year; but, if notice were sent on January 11, 2018 (in tax year 2018), termination would not be effective until the 2019 tax year].

II. Duties of the Tax Collector.

1. **Merger of Assessment Rolls.** Pursuant to § 197.3632(7), Florida Statutes, and Rule 12D-004(1)(b), Florida Administrative Code, the Tax Collector shall work with the Local Government to include the Local Government's non-ad valorem assessment roll in the combined notice for ad valorem taxes and non-ad valorem assessments as provided in § 197.3635, Florida Statutes. Separate notices of non-ad valorem assessments shall not be mailed unless otherwise warranted as a solution to the most exigent factual circumstances. In deciding whether a separate mailing is necessary, the Tax Collector shall consider all costs to the Local Government and taxpayers of such separate mailing and the adverse effects of delayed and multiple notices to taxpayers. If, for whatever reason, the Local Government's non-ad valorem assessment roll cannot be merged with the ad valorem tax roll in the combined notice for taxes and assessments, the Local Government shall bear all costs associated with the provision of separate notice. Such costs are not factored into the per unit assessment rate identified in Article IV of this Agreement, and, if the Tax Collector incurs any such costs on the Local Government's behalf, the Tax Collector shall separately invoice the Local Government for reimbursement thereof.

2. **Software / Data Storage.** The Tax Collector maintains software, which it will use to edit and store the non-ad valorem assessment roll received from the Local Government. The Tax Collector will maintain the Local Government's non-ad valorem

assessment roll and related programs in the same manner as other Volusia County tax data.

3. **Cooperation.** In addition to the foregoing, the Tax Collector will make reasonable efforts to assist and accommodate the Local Government's collection of non-ad valorem assessments, cooperate with the Local Government and the Volusia County Tax Collector to implement the Uniform Method pursuant to and consistent with Chapter 197, Florida Statutes, including §§ 197.3632 and 197.3635 thereof, and make available the Tax Collector's methodology and data used to calculate the per unit cost described in Article IV of this Agreement.

III. Duties of the Local Government.

1. **Non-Ad Valorem Assessment.** The Local Government warrants that the Assessment(s) to which this Agreement applies is valid, lawfully imposed, and duly levied by the Local Government on the properties subject thereto. The Local Government further agrees to post the non-ad valorem assessment(s) for each parcel on the non-ad valorem assessment roll in a manner such that the assessment roll is free of errors and omissions.

2. **Reimbursement.** Each year, the Local Government shall pay to the Tax Collector the necessary administrative costs of collection incurred by the Tax Collector in the administration of the Assessment(s) pursuant to Article IV (titled "Payment of Administrative Costs") of this Agreement.

3. **Assessment Rate.** By September 15th of each tax year, the Local Government shall, whether by and through its chair of its local governing board or other designee or agent, certify its non-ad valorem assessment roll on compatible electronic medium, to the Tax Collector. The Tax Collector shall not be liable for any delays or failure to implement the Uniform Method with regard to the Assessment(s) if the Local Government fails to timely submit its assessment roll or otherwise submits an incompatible or incomplete assessment roll.

4. **Changes, Modifications, and Corrections.** The Local Government shall designate and authorize a person or entity other than the Tax Collector who will receive and process any request for changes, modifications, or corrections to the non-ad valorem assessment roll and, if necessary, file with the Tax Collector an appropriate certificate of correction.

5. **Coordination.** The Local Government shall cooperate with the Tax Collector to implement the Uniform Method pursuant to and consistent with applicable state law and any relevant regulations duly promulgated by the Florida Department of Revenue.

IV. Payment of Administrative Costs.

1. **Per Unit Charge.** The Tax Collector's charge to the Local Government for the units assessed pursuant to the Assessment for the 2022 tax year and for each year thereafter shall be fifty-five cents (55¢) per assessment unit, which per unit charge constitutes the actual cost of collecting the non-ad valorem assessment to the Tax Collector's office as described in § 197.3632(2), Florida Statutes, and Rule 12D-18.004(2), Florida Administrative Code. Because such per unit charge is the actual cost to the Tax Collector's office of administering the Assessment pursuant to the Uniform Method, such charge shall be subject to unilateral adjustment by the Tax Collector on an annual basis to account for fluctuations in such cost.

2. **Adjustments.** If the Tax Collector, after review of its operations and other relevant data, determines the charge should be either increased or decreased, it shall send written notice to the Local Government of the adjustment. If notice is sent prior to January 10th of the current tax year, the adjusted charge shall be effective within the current tax year. Otherwise, such notice shall be effective in the next tax year.

3. **Challenges.** If the Local Government believes the adjusted charge does not reflect the actual cost of the administrative services provided by the Tax Collector's office pursuant to this Agreement or otherwise violates § 197.3632(8)(c), Florida Statutes, the Local Government may, within 10 (ten) days of its receipt of such notice, send a notice to the Tax Collector's office objecting to the adjustment, which notice shall include a concise summary of the reason(s) as to why the Local Government objects and a request for a meeting with the Tax Collector's chief financial officer to reconsider the adjustment. Failure to request such meeting shall be deemed a waiver of the Local Government's right to challenge the adjustment. If requested, the meeting shall be scheduled within twenty (20) days of the receipt of such request. The Tax Collector's chief financial officer shall render a final decision regarding the adjusted charge within ten (10) days following such meeting or such other time as may be agreed upon by the Local Government and the Tax Collector. Such final decision shall be binding as to both parties and constitute final agency action.

4. **Payment.** The Local Government agrees that the payment due pursuant to this Agreement may be withheld by the Tax Collector from the revenue collected from the Assessment, regardless of whether payment has actually been collected on each parcel subject to the assessment. If such withhold does not occur or insufficient Assessment revenue is collected to reimburse, the Tax Collector may invoice the Local Government for payment of any deficiency pursuant to the applicable provisions of Part VII of Chapter 218, Florida Statutes.

V. Miscellaneous.

1. **Indemnification.** The Local Government agrees to indemnify, defend, and hold harmless the Tax Collector from and against any claims, sanctions, costs, or damages imposed against or incurred by the Tax Collector, including, but not limited to,

attorney's fees or costs, which claims, sanctions, costs, or damages arise from (i) any act or omission committed by the Local Government in adopting, administering, levying, or enforcing the Assessment, (ii) any defect in the Assessment itself, (iii) any challenge regarding the validity or legality of the Assessment, or (iv) any defect in the certified non-ad valorem assessment roll submitted to the Tax Collector pursuant to § 197.3632(5)(a), Florida Statutes.

2. **Entire Agreement.** This Agreement embodies the whole understanding of the parties. There are no promises, terms, conditions, or obligations other than those contained herein, and this Agreement shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties hereto.

3. **Amendment.** Unless otherwise expressly provided herein, any alteration, variation, modification, extension, renewal, or waiver of the provisions of this Agreement shall be valid only when reduced to writing, duly authorized and signed by all parties.

4. **Notices.** All notices or other communications hereunder shall be in writing and shall be deemed duly given if delivered in person or sent certified or registered mail, return receipt requested, first class, postage prepaid, and addressed as follows:

IF TO LOCAL GOVERNMENT:

City Manager

1000 City Center Circle

Port Orange, FL 32129

WITH COPY TO:

Local Government Attorney

1000 City Center Circle

Port Orange, FL 32129

IF TO TAX COLLECTOR: WITH COPY TO:

Volusia County Tax Collector
123 West Indiana Avenue
Room 103
DeLand, FL 32720

5. **Construction – Governing Law.** This Agreement is intended to complement the statutes and regulations pertaining to the Uniform Method and shall be construed together with the applicable provisions of Section 197.3632, Florida Statutes, and Rule 12D-18.004, Florida Administrative Code, or any successor statutes or rules, as such may be amended or supplemented from time to time. Any duly adopted statutes or regulations pertaining to the Uniform Method and administration thereof shall (i) govern those items not specifically covered herein and (ii) are hereby incorporated by reference. If any terms or conditions of this Agreement conflict with duly enacted statutes or adopted

regulations pertaining to the Uniform Method, such statutes or regulations shall govern to the extent any such conflict exists.

6. **Sovereign Immunity.** Regardless of anything set forth in this section or any other part of this Agreement to the contrary, each party expressly retains all rights, benefits, and immunities of the doctrine of sovereign immunity in accordance with § 768.28, Florida Statutes, and nothing in this Agreement shall be deemed as a waiver of the doctrine of sovereign immunity or any of the limits of liability of either party beyond any statutory limited waiver of immunity or those limits of liability which may have been or may be adopted by the Florida Legislature. Nothing in this Agreement shall be read or otherwise interpreted to require or otherwise allow the indemnification of one party for the negligent acts of the other in contravention of § 768.28, Florida Statutes, nor shall anything in this Agreement inure to the benefit of any third party for the purpose of allowing any claim against either party, which would otherwise be barred under the doctrine of sovereign immunity or by operation of law.

IN WITNESS WHEREOF, the parties have executed this Agreement with Volusia County Tax Collector for the Utilization of the Uniform Method of Collection of Non-Ad Valorem Assessments on the day and year written below.

ATTEST:

City of Port Orange

By: _____

Robin L. Fenwick, MMC, City Clerk

Donald O. Burnette

Chair/Mayor

ATTEST:

VOLUSIA COUNTY TAX COLLECTOR

By: _____

Will Roberts

Volusia County Tax Collector

**AGREEMENT WITH THE VOLUSIA COUNTY
PROPERTY APPRAISER
FOR THE UTILIZATION OF THE UNIFORM METHOD OF
COLLECTION OF NON-AD VALOREM ASSESSMENTS**

This Agreement with the Volusia County Property Appraiser for the Utilization of the Uniform Method of Collection of Non-Ad Valorem Assessments ("Agreement") is made and entered into by and between City of Port Orange ("Local Government"), a local government as such term is defined in § 197.3632, Florida Statutes, and the **County of Volusia, Florida, by and through the Volusia County Property Appraiser** ("Property Appraiser").

WHEREAS, the Local Government wants to levy, collect, and enforce its non-ad valorem assessments utilizing the uniform method for the levy, collection, and enforcement of its non-ad valorem assessments, as provided for in §§ 197.3632 and 197.3635, Florida Statutes ("Uniform Method"); and

WHEREAS, pursuant to § 197.3632(2), Florida Statutes, and Rule 12D-18.004(2), Florida Administrative Code, the Local Government must enter into an agreement with the Property Appraiser to provide for the reimbursement of the necessary administrative costs incurred in the utilization of the Uniform Method; and

WHEREAS, Rule 12D-18.004(1), Florida Administrative Code, further requires an agreement between the Local Government and the Property Appraiser governing data assembly and the exchange of information between the Local Government and the Property Appraiser; and

WHEREAS, Rule 12D-18.004(1)(c), Florida Administrative Code, requires the Local Government to enter into an agreement with the Property Appraiser for each non-ad valorem assessment roll, and each such agreement must comply with the requirements of Rule 12D-18.004; and

WHEREAS, the Local Government wants to enter into an agreement with the Property Appraiser for the preparation of the Local Government's non-ad valorem assessment roll in a compatible electronic medium tied to the property identification number, as permitted by Rule 12D-18.004(1)(a), Florida Administrative Code; and

WHEREAS, pursuant to § 197.3632(5)(a), Florida Statutes, the Local Government further opts to designate the Property Appraiser as the Local Government's agent for the limited purpose of certifying and submitting the non-ad valorem assessment roll to the county revenue division; and

WHEREAS, this Agreement is intended to meet the requirements of both § 197.3632, Florida Statutes, and Rule 12D-18.004, Florida Administrative Code, as such pertain to the Local Government's use of the Uniform Method and the Property Appraiser's administrative duties pursuant thereto.

NOW, THEREFORE, in consideration of the agreements, promises, and covenants set forth herein and other good and valuable consideration, the parties agree as follows:

I. General.

1. **Application.** Commencing with the 2016 tax year, this Agreement shall apply to the use of the Uniform Method for the non-ad valorem assessment identified in the Local Government's duly adopted resolution attached hereto and incorporated herein as **Exhibit A** ("Assessment").

2. **Term.** The term of this Agreement shall commence upon execution by both parties and be retroactively effective to address the administration of the Assessment for the first tax year for which this Agreement is effective, regardless of whether such administration commenced prior to the actual date of execution. For the purposes of this Agreement, a tax year shall mean and refer to a calendar year. This Agreement shall remain in effect for subsequent years' assessments and shall terminate (i) automatically once the Assessment is paid in its entirety such that no Assessment amounts need to be assessed or collected in a subsequent year or (ii) as otherwise provided herein. Pursuant to § 197.3632(6), Florida Statutes, the Local Government may discontinue use of the Uniform Method and terminate this Agreement upon written notice to the County, Property Appraiser, and Florida Department of Revenue before January 10 of each tax year. Such notice, upon the receipt thereof by the other party, shall terminate this Agreement. If notice is submitted after January 10 of the current tax year, then the Agreement shall continue to remain in effect for the current tax year; however, the Agreement shall be terminated with respect to the next tax year [e.g., if notice were sent December 1, 2017 (in tax year 2017), termination would be effective for the 2018 tax year; if notice were sent on January 5, 2018 (in tax year 2018), termination would be effective for the 2018 tax year; but, if notice were sent on January 11, 2018 (in tax year 2018), termination would not be effective until the 2019 tax year].

II. Duties of the Property Appraiser.

1. **Information.** Pursuant to § 197.3632(3)(b), Florida Statutes, and annually by June 1st of each year, the Property Appraiser shall provide the Local Government by list or compatible electronic medium with the legal description of the properties within the Assessment district together with the property identification numbers and names and addresses of the owners of all such properties. The Property Appraiser shall further provide any other information reasonably needed by the Local Government to create, recompute, reconfigure, revise, correct, or otherwise formulate the non-ad valorem assessment rolls as may be agreed to by the Property Appraiser.

2. **Preparation and Submittal of the Non-Ad Valorem Assessment Roll.** Pursuant to Rule 12D-18.004(1)(a), Florida Administrative Code, the Local Government

hereby names the Property Appraiser as its designee for the limited purposes of (i) preparing the Local Government's non-ad valorem assessment roll for the Assessment in a compatible electronic medium tied to the property identification number and (ii) certifying and submitting, in the name of the city, the non-ad valorem assessment roll to the county revenue division (a part of the department which has assumed the functions and duties of the tax collector pursuant to § 601.1(1)(a) of the Volusia County Charter) by September 15th of each tax year pursuant to § 197.3632(5)(a), Florida Statutes. The Property Appraiser agrees to serve as the Local Government's designee for such limited purposes and shall provide such services on behalf of the Local Government during the term of this Agreement unless otherwise agreed by the parties in writing. Regardless of the foregoing, the Property Appraiser's preparation of the non-ad valorem assessment roll hereunder shall be preconditioned on the Local Government's cooperation with the Property Appraiser in preparing the ad valorem assessment roll and the Local Government's timely submittal to the Property Appraiser of the Local Government's certified non-ad valorem assessment rate per assessment unit by September 15th of each tax year. Notwithstanding the Property Appraiser's preparation, submittal, or certification of the non-ad valorem assessment roll contemplated herein, the Local Government remains solely responsible for ensuring that such certified roll contains no errors or omissions as stated in § 197.3632(5)(a), Florida Statutes, and the Property Appraiser assumes no liability or responsibility for any such errors and omissions.

3. **Software / Data Storage.** The Property Appraiser maintains software, which it will use to edit and store any information provided to the Property Appraiser for use in fulfilling the Property Appraiser's obligations pursuant to this Agreement and its general administration of the Uniform Method pursuant to Chapter 197, Florida Statutes, and Rule 12D-18.004, Florida Administrative Code. The Property Appraiser will store and maintain the Local Government's data and related programs in the same manner as he/she maintains and safeguards other Volusia County tax data.

4. **Cooperation.** In addition to the foregoing, the Property Appraiser will make reasonable efforts to assist and accommodate the Local Government's creation of a non-ad valorem assessment roll, cooperate with the Local Government and the Volusia County Finance Department and Revenue Division to implement the Uniform Method pursuant to and consistent with Chapter 197, Florida Statutes, including §§ 197.3632 and 197.3635 thereof, and make available the Property Appraiser's methodology and data used to calculate the per unit cost described in Article IV of this Agreement.

III. Duties of the Local Government.

1. **Non-Ad Valorem Assessment.** The Local Government warrants that the Assessment to which this Agreement applies is valid, lawfully imposed, and duly levied by the Local Government on the properties subject thereto as described in **Exhibit A**. The Local Government further agrees to post the non-ad valorem assessment for each

parcel on the non-ad valorem assessment roll in a manner such that the assessment roll is free of errors and omissions.

2. **Reimbursement.** Each year, the Local Government shall pay to the Property Appraiser the necessary administrative costs of collection incurred by the Property Appraiser in the administration of the Assessment pursuant to Article IV (titled "Payment of Administrative Costs") of this Agreement.

3. **TRIM Notice.** The Local Government shall cooperate with the County in the preparation and delivery of the Truth in Millage Notice as provided for in § 200.069, Florida Statutes, and agrees to timely notify the Property Appraiser of the Local Government's proposed non ad valorem assessment rate per unit and the taxpayer contact information that will be displayed on such notice. Notice of the proposed or adopted non-ad valorem assessment must be included in such notice as set forth in § 200.069(10), Florida Statutes.

4. **Certification of the Non-Ad Valorem Assessment Rate.** By September 15th of each tax year, the Local Government shall submit to the Property Appraiser the certified non-ad valorem assessment rate per unit to the Property Appraiser. The Property Appraiser shall not be liable for any delays or failure to prepare, certify, or submit the Local Government's non-ad valorem assessment roll or to otherwise implement the Uniform Method with regard to the Assessment if the Local Government (i) fails to timely submit such certified non-ad valorem assessment rate (ii) provides an incorrect rate, or (iii) provides a rate in a corrupted format or a format that cannot be accessed or read by the Property Appraiser.

5. **Changes, Modifications, and Corrections.** The Local Government shall designate and authorize a person or entity other than the Property Appraiser who will receive and process any request for changes, modifications, or corrections to the non-ad valorem assessment roll and, if necessary, file with the Property Appraiser an appropriate certificate of correction.

6. **Additional Information.** If the Local Government determines that the information supplied by the Property Appraiser pursuant to Article II, § 1. Information of this Agreement is insufficient for the Local Government's purposes, the Local Government shall obtain further information from other sources.

7. **Coordination.** The Local Government shall cooperate with the Property Appraiser to implement the Uniform Method pursuant to and consistent with applicable state law and any relevant regulations duly promulgated by the Florida Department of Revenue.

IV. Payment of Administrative Costs.

1. **Per Unit Charge.** The Property Appraiser's charge to the Local Government for the units assessed pursuant to the Assessment for the 2016 tax year

and for each year thereafter unless otherwise adjusted shall be seventy-seven cents (77¢) per assessment unit, which per unit charge constitutes the actual cost of collecting the non-ad valorem assessment to the Property Appraiser's office as described in § 197.3632(2), Florida Statutes, and Rule 12D-18.004(2), Florida Administrative Code. Because such per unit charge is the actual cost to the Property Appraiser of administering the Assessment pursuant to the Uniform Method, such charge shall be subject to unilateral adjustment by the Property Appraiser on an annual basis to account for fluctuations in such cost.

2. **Adjustments.** If the Property Appraiser, after review of his/her operations and relevant data, determines the charge should be either increased or decreased, he/she shall send written notice to the Local Government of the adjustment. If notice is sent prior to January 10th of the current tax year, the adjustment shall be effective within the current tax year. Otherwise, such notice shall be effective in the next tax year.

3. **Challenges.** If the Local Government believes the adjusted charge does not reflect the actual cost of the administrative services provided by the Property Appraiser pursuant to this Agreement or otherwise violates § 197.3632(2), Florida Statutes, the Local Government may, within 10 (ten) days of its receipt of such notice, send a notice to the Property Appraiser objecting to the adjustment, which notice shall include a concise summary of the reason(s) as to why the Local Government is objecting and a request for a meeting with the Property Appraiser to reconsider the adjustment. Failure to request such meeting shall be deemed a waiver of the Local Government's right to challenge the adjustment. If requested, the meeting shall be scheduled within twenty (20) days of the receipt of such request. The Property Appraiser shall render a final decision regarding the adjusted charge within ten (10) days following such meeting or such other time as may be agreed upon by the Local Government and the Property Appraiser. Such final decision shall be binding as to both parties and constitute final agency action.

4. **Payment.** The Local Government agrees that the payment due pursuant to this Agreement may be withheld by the Volusia County Finance Department from the revenue collected from the Assessment and transferred to the Property Appraiser. If such withhold does not occur or insufficient Assessment revenue is collected to reimburse the Property Appraiser pursuant to this Agreement, the Property Appraiser may invoice the Local Government for payment of any deficiency pursuant to the applicable provisions of Part VII of Chapter 218, Florida Statutes.

V. Miscellaneous.

1. **Indemnification.** The Local Government agrees to indemnify, defend, and hold harmless Volusia County and its Property Appraiser from and against any claims, sanctions, costs, or damages imposed against or incurred by Volusia County or its Property Appraiser, including, but not limited to, attorney's fees or costs, which claims, sanctions, costs, or damages arise from (i) any act or omission committed by the Local Government in adopting, administering, levying, or enforcing the Assessment,

(ii) any defect in the Assessment itself, (iii) any challenge regarding the validity or legality of the Assessment, or (iv) any defect in the certified non-ad valorem assessment roll submitted to Volusia County pursuant to § 197.3632(5)(a), Florida Statutes.

2. **Entire Agreement.** This Agreement embodies the whole understanding of the parties. There are no promises, terms, conditions, or obligations other than those contained herein, and this Agreement shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties hereto.

3. **Amendment.** Unless otherwise expressly provided herein, any alteration, variation, modification, extension, renewal, or waiver of the provisions of this Agreement shall be valid only when reduced to writing, duly authorized and signed by all parties.

4. **Notices.** All notices or other communications hereunder shall be in writing and shall be deemed duly given if delivered in person or sent certified or registered mail, return receipt requested, first class, postage prepaid, and addressed as follows:

IF TO LOCAL GOVERNMENT:

City Manager

1000 City Center Circle

Port Orange, FL 32129

WITH COPY TO:

Local Government Attorney

1000 City Center Circle

Port Orange, FL 32129

IF TO COUNTY:

Volusia County Property Appraiser
123 West Indiana Avenue
Room 102
DeLand, FL 32720

WITH COPY TO:

Volusia County Attorney
123 West Indiana Avenue
DeLand, FL 32720

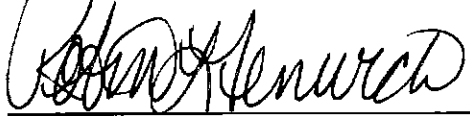
5. **Construction – Governing Law.** This Agreement is intended to complement the statutes and regulations pertaining to the Uniform Method and shall be construed together with the applicable provisions of the Florida Statutes and any duly promulgated Department of Revenue rules pertaining to the Uniform Method, including, but not limited to § 197.3632, Florida Statutes, and Rule 12D-18.004, Florida Administrative Code, or any successor statutes or rules, as such may be amended or supplemented from time to time. Any duly adopted statutes or regulations pertaining to the Uniform Method and the administration thereof shall (i) govern those items not specifically covered herein and (ii) are hereby incorporated by reference. If any terms or conditions of this Agreement conflict with duly enacted statutes or adopted

regulations pertaining to the Uniform Method, such statutes or regulations shall govern to the extent any such conflict exists.

6. **Sovereign Immunity.** Regardless of anything set forth in this section or any other part of this Agreement to the contrary, each party expressly retains all rights, benefits, and immunities of the doctrine of sovereign immunity in accordance with § 768.28, Florida Statutes, and nothing in this Agreement shall be deemed as a waiver of the doctrine of sovereign immunity or any of the limits of liability of either party beyond any statutory limited waiver of immunity or those limits of liability which may have been or may be adopted by the Florida Legislature. Nothing in this Agreement shall be read or otherwise interpreted to require or otherwise allow the indemnification of one party for the negligent acts of the other in contravention of § 768.28, Florida Statutes, nor shall anything in this Agreement inure to the benefit of any third party for the purpose of allowing any claim against either party, which would otherwise be barred under the doctrine of sovereign immunity or by operation of law.

IN WITNESS WHEREOF, the parties have executed this Agreement with the Volusia County Property Appraiser for the Utilization of the Uniform Method of Collection of Non-Ad Valorem Assessments on the day and year written below.

ATTEST:

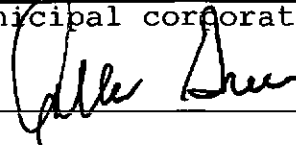


Robin L. Fenwick, City Clerk

8/16/17

CITY OF PORT ORANGE, a Florida
municipal corporation

By:



Allen Green, Mayor

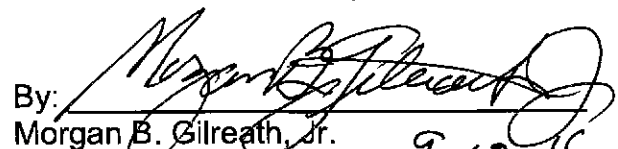
Chair/Mayor

8/16/17

ATTEST:

PROPERTY APPRAISER
COUNTY OF VOLUSIA, FLORIDA

By:



Morgan B. Gilreath, Jr.
Property Appraiser
Volusia County, Florida

9-12-16

2020 Final Non-Ad Valorem Assessment (NAVA) Roll Summary

Name	Code	#Parcels	#Units	Rate	Amount
ISLESBORO WASTEWATER-A	6016	18	21.00	\$826.55	\$17,357.55
ISLESBORO WASTEWATER-B	6017	25	26.00	\$548.96	\$14,272.96
City of New Smyrna Beach - Total:	5	18,399	28,222.53		\$2,603,884.19
City of Oak Hill					
<i>Solid Waste:</i>					
OAK HILL SOLID WASTE	6031	1,015	1,062.00	\$210.00	\$223,020.00
City of Oak Hill - Total:	1	1,015	1,062.00		\$223,020.00
City of Orange City					
<i>Solid Waste:</i>					
ORANGE CITY SOLID WASTE	0141	2,589	2,636.00	\$167.52	\$441,582.72
<i>Drainage & Water Control/Mgmt:</i>					
ORANGE CITY STORMWATER	0143	3,547	53,249.65	\$14.11	\$751,352.56
<i>Lighting:</i>					
SHADOW RIDGE PHASE 2	3450	79	79.00	\$135.00	\$10,665.00
BRIARWOOD SOUTH	2040	42	42.00	\$52.00	\$2,184.00
City of Orange City - Total:	4	6,257	56,006.65		\$1,205,784.28
PACE Districts					
<i>Other:</i>					
GREEN CORRIDOR PACE	8901	18	18.00	VARIES	\$30,074.70
FLORIDA PACE FUNDING AGENCY	8902	1	1.00	VARIES	\$1,518.33
FLORIDA GREEN FINANCE AUTH **NEW FOR 2020	8903	6	6.00	VARIES	\$12,655.93
FLORIDA RESILIENCY ENERGY DISTRICT (FRED) **NEW FOR 2020	8904	1	1.00	VARIES	\$2,195.56
PACE Districts - Total:	4	26	26.00		\$46,444.52
Pioneer CDD					
<i>Community Development or Redevelopment:</i>					
PIONEER CDD	6021	300	300.00	\$366.21	\$98,510.49
Pioneer CDD - Total:	1	300	300.00		\$98,510.49
City of Port Orange					
<i>Drainage & Water Control/Mgmt:</i>					
PORT ORANGE STORMWATER	4021	22,938	38,773.00	\$115.00	\$4,456,990.60
City of Port Orange - Total:	1	22,938	38,773.00		\$4,456,990.60
County of Volusia					
<i>Solid Waste:</i>					
VOLUSIA COUNTY GARBAGE	5050	43,780	44,953.00	\$255.00	\$11,463,015.00
<i>Drainage & Water Control/Mgmt:</i>					
VOLUSIA COUNTY STORMWATER	5030	52,029	66,532.00	\$72.00	\$4,520,534.94
<i>Road Improvements:</i>					
WEST HIGHLANDS MAINT DIST	0105	1,083	3,880.00	\$56.70	\$219,996.00
<i>Lighting:</i>					
A QUIET PLACE IN THE COUNTRY	2560	172	179.00	\$22.00	\$3,938.00
AUDUBON PARK	1880	45	4,304.78	\$0.24	\$1,033.15
AUTUMN WOODS	2640	166	166.00	\$40.00	\$6,640.00
BARRIER ISLE	2360	17	17.00	\$31.00	\$527.00
BERRYS RIDGE	3340	109	109.00	\$49.00	\$5,341.00
BLUE SPRINGS LANDING	2220	26	26.00	\$46.00	\$1,196.00
BON AIR	1890	16	1,220.00	\$0.30	\$366.00
BREEZEWOOD PARK	1810	294	24,435.93	\$0.40	\$9,774.37
CAPISTRANO	2190	50	59.00	\$22.00	\$1,298.00



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 5/18/2021

Consent item: Yes

SUBJECT: (C16) Approval of Volusia County Justice Assistance Grant (JAG) Agency Funding Allocation

DEPARTMENT: Police Services

GOAL: 3 - Quality of Life

RECOMMENDED MOTION: Move to approve the allocation of funding of the Justice Assistance Grant (JAG) Agency.

SUMMARY: Volusia County is eligible to receive funding from the FY 2020/21 share of the Edward Byrne Memorial Justice Assistance Grant (JAG) County-wide funds that were released by the Florida Department of Law Enforcement (FDLE) in April 2021. In order to submit nonprofit agencies applications for this funding the County must receive approval from 51% of cities located within Volusia County.

The JAG program focuses on providing funding to several municipalities to improve the criminal justice system through one or more purpose areas. This includes but not limited to programs focused on law enforcement, prosecution/court, prevention/education, drug treatment and enforcement programs. The County of Volusia is recommending the funds be allocated to the non-profits SMA Healthcare, Inc. Adult Drug Court program and the House Next Door Success by Design program.

Grant regulations require approval of the funding distribution by the majority of all local governments within the county. A letter certifying our city approves of the recommended allocation of funds to SMA Healthcare, Inc. and the House Next Door is required. In previous years Port Orange provided support of these programs. No financial or other commitments are required from Port Orange.

Project No.: N/A

Funding Account No.: 0000000000000000

Presenter: Thomas Grimaldi

ATTACHMENTS:

1.	Mayor Sample Letter_Port Orange	Mayor Sample Letter_Port Orange.docx
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Robin Fenwick

Created/Initiated - 4/30/2021

Amanda Lasecki	Approved - 4/30/2021
Thomas Grimaldi	Approved - 5/3/2021
Matthew Jones	Approved - 5/5/2021
Wayne Clark	Approved - 5/7/2021
Robin Fenwick	Final Approval - 5/7/2021

April 29, 2021

Mr. Clyde Smith, FCCM
Government Operations Consultant I
Florida Department of Law Enforcement
Office of Criminal Justice Grants
PO BOX 1489
Tallahassee, FL 32302

Dear Mr. Smith:

In compliance with State of Florida Rule 11D-9, F.A.C., the City of Port Orange approves the distribution of \$129,365 of Federal Fiscal Year 2020/21 Edward Byrne Memorial Justice Assistance Grant (JAG) County-wide program for the following projects within Volusia County.

Sub-award Recipient	Contractor & Title of Project	Amount
County of Volusia	SMA Healthcare, Inc. - Adult Drug Court Program	\$100,782
County of Volusia	The House Next Door - Success by Design Program	\$28,583
	Total	\$129,365

Sincerely,

Honorable Mayor Donald O. Burnette
City of Port Orange

Date



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 5/18/2021

Consent item: No

SUBJECT: (G19) First Reading - Ordinance No. 2021-10 - Fire and Rescue Pension Fund Sections 54-77 and 54-104

DEPARTMENT: Administrative Services

GOAL: Organizational Excellence

RECOMMENDED MOTION: Move to approve Ordinance 2021-10.

SUMMARY: On January 19, 2021 the new International Association of Firefighters (IAFF) Collective Bargaining Agreement (CBA) was ratified. During the negotiation process, proposed changes were made to Article 22 Retirement Plan. These changes involve having specialty and incentive pay included for purposes of member benefit calculations upon retirement as well as changing the multiplier from 2.5% to 3% for members hired after September 25, 2012. Additional clean-up language has also been added to clarify annual maximums limits in accordance with the Internal Revenue Code. The actuarial study is attached to this item describing the fiscal impact to the plan.

Project No.: N/A

Funding Account No.: N/A

Presenter: Jamie Miller

ATTACHMENTS:

1.	Ord No. 2021-10 - Port Orange Fire Pension Ordinance 5.7.21	Ord No. 2021-10 - Port Orange Fire Pension Ordinance 5.7.21.pdf
2.	IAFF Ratified Article 22	IAFF Ratified Article 22.pdf
3.	2021.04.07, Actuarial Cost Study of Proposed Benefit Changes - Port Orange Fire	2021.04.07, Actuarial Cost Study of Proposed Benefit Changes - Port Orange Fire.pdf

Heather Carrizales
Heather Carrizales
Jamie Miller
Matthew Jones
Wayne Clark

Created/Initiated - 4/13/2021
Approved - 4/13/2021
Approved - 5/2/2021
Approved - 5/7/2021
Approved - 5/9/2021

ORDINANCE 2021-10

AN ORDINANCE OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA, AMENDING CHAPTER 54, ARTICLE IV, FIRE AND RESCUE PENSION FUND, BY AMENDING SECTION 54-77, DEFINITIONS; AMENDING SECTION 54-104, BENEFITS AND CONTRIBUTION FOR MEMBERS HIRED ON OR AFTER DECEMBER 4, 2012; PROVIDING FOR REPEAL OF CONFLICTING RESOLUTIONS; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the City of Port Orange and the Port Orange Professional Firefighters Association IAFF, Local 3118 have ratified a new collective bargaining agreement for the term October 1, 2020 through September 30, 2021, that includes certain changes to pension benefits as provided for herein; and

WHEREAS, an amendment to the Port Orange Fire and Rescue Pension Fund ordinance is necessary to implement the pension changes; and

WHEREAS, certain other changes to the Pension Fund ordinance have been recommended by the Board of Trustees of the Port Orange Fire and Rescue Pension Fund to clarify language and comply with the Internal Revenue Code; and

WHEREAS, the Board of Trustees of the Pension Fund have considered such an amendment to be in the best interest of the participants and beneficiaries as well as serving to improve the administration of the Pension Fund; and

WHEREAS, the City Council has received and reviewed an actuarial impact statement related to this change to the Pension Fund; and

WHEREAS, the City Council has determined that it is in the best interest of the citizens of the City of Port Orange to amend its code of ordinances as set forth hereinafter; and

WHEREAS, for purposes of this ordinance words with underlined (underlined) type shall constitute additions to the original text and words with strikethrough (~~strikethrough~~) type shall constitute deletions from the original text.

NOW, THEREFORE, BE IT ENACTED BY THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA:

Section 1. Section 54-77, Definitions, is hereby amended by revising the definition of “salary” as follows:

Section 54-77, Definitions.

* * * * *

Salary means the ~~m~~Member's fixed compensation (base pay) for services rendered to the city as a firefighter, plus all tax-deferred, tax-sheltered and tax-exempt items of income derived from elective employee payroll deductions or salary reductions. Base pay excludes overtime, education pay, specialty and incentive pay, lump sum payments of annual leave, sick leave, and compensation leave, and all other nonregular compensation. Notwithstanding the preceding sentence, effective July 1, 2021 salary shall include specialty and incentive pay. Compensation in excess of the limitations set forth in section 401(a)(17) of the Code. As of the first day of the plan year shall be disregarded for any purpose, including employee contributions or any benefit calculations. The annual compensation of each ~~m~~Member taken into account in determining benefits or employee contributions for any plan year may not exceed the dollar limit imposed under IRC Section 401(a)(17) or use more than this amount in applying certain nondiscrimination rules beginning on or after January 1, 2002, may not exceed \$200,000.00, as adjusted for cost of living increases in accordance with Internal Revenue Code Section 401(a)(17)(B). Compensation means compensation during the fiscal year. The cost-of-living adjustment in effect for a calendar year applies to annual compensation for the determination period that begins with or within such calendar year. If the determination period consists of fewer than 12 months, the annual compensation limit is an amount equal to the otherwise applicable annual compensation limit multiplied by a fraction, the numerator of which is the number of months in the short determination period, and the denominator of which is 12. If the compensation for any prior determination period is taken into account in determining a ~~m~~Member's contributions or

benefits for the current plan year, the compensation for such prior determination period is subject to the applicable annual compensation limit in effect for that prior period. The limitation on compensation for an eligible employee shall not be less than the amount which was allowed to be taken into account in effect on July 1, 1993. Eligible employee means an individual who was a ~~m~~Member before the first plan year beginning after December 31, 1995.

Section 2. Section 54-104, Benefits and contribution for members hired on or after December 4, 2012, is hereby amended as follows:

Sec. 54-104. - Benefits and contribution for members hired on or after December 4, 2012.

Notwithstanding any other provision of this system, ~~M~~members hired on or after December 4, 2012, shall be subject to the provisions of sections 54-76 through 54-103, except as otherwise provided below:

* * *

(4) The definition of salary is base pay and excludes overtime, education pay, specialty and incentive pay, lump sum payments of annual and sick leave, and compensation leave, and all other non-regular compensation. Notwithstanding the preceding sentence, effective July 1, 2021 salary shall include specialty and incentive pay.

* * *

(6) The maximum benefit at retirement shall not exceed the lesser of 90~~80~~ percent of average final compensation or. ~~The maximum annual benefit shall not exceed \$95,000.00.~~ However, in no event shall a member receive a benefit that is less than two percent of average final compensation for each year of credited service.

* * *

(8) The benefit multiplier shall be three~~two and one-half~~ percent of average final compensation per year of credited service.

Section 3. The provisions of this Ordinance shall become and be made a part of the Code of Ordinances of the City of Port Orange and the Sections of this Ordinance

may be renumbered or re-lettered to accomplish such intent. The Code codifier is granted reasonable authority to codify the provisions of this Ordinance.

Section 4. All ordinances or parts of ordinances in conflict with this ordinance are hereby repealed to the extent of such conflict.

Section 5. If any provision of this ordinance or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provision or applications of this Ordinance which can be given effect without the invalid provision or application, and to this and the provisions of this Ordinance are declared severable.

Section 6. This Ordinance shall be effective upon passage; however, the provisions of this Ordinance that are specified to take effect as of a date certain shall take effect as of the date specified herein.

MAYOR DONALD O. BURNETTE

ATTEST:

Robin L. Fenwick, MMC, City Clerk

Passed on first reading on the ____ day of _____, 2021.

Passed and adopted on second and final reading on the ____ day of _____, 2021.

Reviewed and Approved: _____
Matthew Jones, City Attorney

ARTICLE 22

RETIREMENT PLAN

22.1 The parties hereto recognize that the employees in the Bargaining Unit are participants in a Retirement Plan of the City as provided for by Chapter 175, Florida Statutes, and Section 54-76, etc. of the Code of Ordinances, City of Port Orange, Florida (hereby referred to as the "Retirement Plan"). Pensions and other retirement benefits for bargaining Unit employees which are not specifically enumerated in this labor Agreement are as set forth in the Retirement Plan. The City agrees to maintain the benefits and member contributions set forth in the Retirement Plan, with the changes provided below. An employee in this bargaining Unit who enters the DROP program on and after the effective date of this contract shall be subject to all of the terms of this contract including this Article.

The parties agree to amend the Retirement Plan following the adoption of the Ordinance implementing this Article, with changes to benefits effective the first of the month following the adoption of the Ordinance, as follows:

22.2 For members hired on or after September 25, 2012 the accrued benefit will be determined as 3.00% of Average Final Compensation for each year of Credited Service. The maximum benefit is the lesser of 90% of Average Final Compensation and \$95,000.

The definition of Salary will be amended to include the additional item of all Specialty and Incentive Payments as pensionable compensation for calculating benefits.

22.3 Reserved.

22.4 After the Retirement Plan achieves a funded ratio of 100% or greater as reflected in the current Disclosure Information prepared in accordance with Governmental Accounting Standards Board requirements, the City will make a contribution, of the higher of either the normal cost of the plan or a minimum thirteen percent (13%) towards a stabilization fund for use during economic downturns to smooth the volatility of required pension payments. This contribution shall be paid to the pension fund and shall not be used by the City or the members to acquire or fund new or additional benefits.

22.5 Should an issue arise with the State Division of Retirement regarding any provisions in this Article, both parties agree to work together to resolve the issues in order to gain approval of Plan changes.

22.6

Mutual Consent Agreement:

In compliance with section 175.351(6), F.S., a defined contribution plan component ("share plan") has been established as part of the benefit pension plan, to be funded exclusively with Ch. 175 premium tax revenues. However, the City and Union have mutually agreed that no Ch. 175 premium tax revenues will be allocated to a share plan at this time. The share plan shall not be activated until Ch. 175 premium tax revenues are allocated to the share plan by mutual agreement of the parties. At such time in which the City and Union agree to allocate Ch. 175 premium tax revenues to the share plan, the parties will negotiate the details of the share plan. All annual premium tax revenues received pursuant to Ch. 175 will continue to offset the City's pension contributions. All accumulated excess premium tax revenues as of 10/01/16 will be used to offset the City's pension contributions.

CITY OF PORT ORANGE
FIRE AND RESCUE PENSION FUND

ACTUARIAL COST STUDY OF PROPOSED BENEFIT CHANGES
April 7, 2021



FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

April 7, 2021

Jamie Miller
Administrative Services Director
City of Port Orange

Re: Actuarial Cost Study of Proposed Assumption Changes

Dear Ms. Miller:

As requested in your February 8, 2021 email, we have performed a special actuarial analysis to determine the impact on the plan's funding requirements associated with the following benefit changes:

1. Benefit Rate / Maximum Benefit: for Firefighters hired on or after September 25, 2012 ("Tier 2" Firefighters) the accrued benefit is determined as 3.00% of Average Final Compensation for each year of Credited Service. The maximum benefit is the lesser of 90% of Average Final Compensation and \$95,000.

Current plan: 2.50% of Average Final Compensation for each year of Credited Service. The maximum benefit is the lesser of 80% of Average Final Compensation and \$95,000.

2. Definition of Salary: amend the definition of Salary to include all Specialty and Incentive Payments as pensionable compensation for calculating benefits, for both Tier 1 and Tier 2 Firefighters.

Current plan: Salary does not include these items.

The cost impact of change #1, determined as of October 1, 2020 and applicable to the fiscal year ending September 30, 2022, is set forth on the enclosure.

The cost impact of change #2 will be reflected in future valuations. Based on our October 9, 2020 analysis, Scenario 5a, the approximate impact of this change is a decrease of 4.40% in the Required City/State Contribution as Percentage of Payroll and an increase of \$426,709 in the plan's Unfunded Actuarial Accrued Liability (UAAL).

Future actuarial measurements may differ significantly from current measurements due to such factors as the following: plan experience differing from that anticipated by assumptions; changes in assumptions; increases or decreases expected as part of the natural operation of the methodology used (such as the end of an amortization period); changes in plan provisions or applicable law.

It should also be noted that this change to retirement benefits could potentially affect participants' retirement behavior. The results of this analysis do not reflect any change in the retirement assumption, but we will monitor the assumption should benefits be changed in order to ensure that the assumption is in line with anticipated future plan experience.

All assumptions and methods used are the same as described in the October 1, 2020 actuarial valuation report unless otherwise indicated. All of the sections of this report are considered an integral part of the actuarial opinions and of this analysis.

The funding percentages and UAAL as measured based on the actuarial value of assets will differ from similar measures based on the market value of assets. These measures, as provided, are appropriate for determining the adequacy of future contributions, but may not be appropriate for the purpose of settling a portion or all of its liabilities.

The undersigned are familiar with the immediate and long-term aspects of pension valuations and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein.

Respectfully submitted,

FOSTER & FOSTER INC.



Douglas H. Lozen, EA, MAAA
Enrolled Actuary #20-7778



Tyler A. Koftan, EA, MAAA
Enrolled Actuary #20-8685

SUMMARY OF ACTUARIAL IMPACT

Below, we have provided a summary of the estimated actuarial impact for the discussed changes.

Change	Scenario	Required City/State Contribution (% of Payroll)	Increase/(Decrease) in Required City/State Contribution (% of Payroll)
	Current	88.30	
(1)	Benefit Rate (3.00%, up to 90% or \$95,000)	89.90	1.60

Change	Scenario	Unfunded Actuarial Accrued Liability (UAAL)	Increase in UAAL	Funded Ratio
	Current	16,218,986		68.7%
(1)	Benefit Rate (3.00%, up to 90% or \$95,000)	16,375,061	156,075	68.5%



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 5/18/2021

Consent item: Yes

SUBJECT: (G20a) Resolution No. 21-22 - Parks and Recreation - Additional funding for contract for REC renovation and expansion

DEPARTMENT: Finance

GOAL: 3 - Quality of Life

RECOMMENDED MOTION: Move to approve Resolution No. 21-22.

SUMMARY: Resolution is requesting approval to appropriate additional funds needed to complete the REC renovation and expansion project (Project No. QPC082) as follows:

Fund 611 - Recreation Impact Fee - Appropriate Fund Balance of \$1,240,000
Fund 317 - General Fund - Capital Projects - Appropriate Fund Balance of \$1,400,000.

This is a companion item with the Award of the contract for REC renovation and expansion (ITB #21-13)

The available fund balance in the General Fund after funding the request will still meet the Policy Requirements of 30% minimum. The current available fund balance in the General Fund is \$17,449,806 which exceeds the 30% target by \$5,751,497. The remaining fund balance after the requested appropriation will be \$16,049,806, which is \$4,351,497 over the required target.

Project No.: QPC082
QPC082

Funding Account No.: Capital
Capital

Presenter: Scott Neils

ATTACHMENTS:

1.	Budget Resolution No. 21-22 with exhibit	Bud Reso 21-22 - REC Remodel Parks and Recreation Funds 611, 001, 317 - (CC Mtg 5-18-2021) (1).pdf
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Lupe Reyna-Coffin
Scott Neils

Created/Initiated - 4/28/2021
Approved - 4/28/2021

Lupe Reyna-Coffin	Approved - 4/28/2021
Scott Neils	Approved - 4/30/2021
Matthew Jones	Approved - 5/6/2021
Wayne Clark	Approved - 5/11/2021
Robin Fenwick	Final Approval - 5/12/2021

RESOLUTION NO. 21-22

A RESOLUTION OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA, APPROPRIATING CAPITAL FUNDS FOR THE FISCAL YEAR 2021 BUDGET; TO DESIGNATE FUND BALANCE FROM THE RECREATIONAL IMPACT FEES FUND (611) IN THE AMOUNT OF \$1,240,000 AND APPROPRIATE TO CAPITAL OUTLAY; TO DESIGNATE FUND BALANCE FROM THE GENERAL FUND (001) IN THE AMOUNT OF \$1,400,000 AND TRANSFER TO THE CAPITAL REPLACEMENT FUND (317) AND APPROPRIATE TO CAPITAL OUTLAY FOR THE RECREATIONAL EDUCATIONAL CULTURAL (REC) CENTER REMODEL AND EXPANSION PROJECT (QPC082) AND; SETTING FORTH REVENUES AND EXPENDITURES; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, The City Council desires to designate and appropriate funds in the amount of \$1,240,000 from the available fund balance in the Recreational Impact Fee Fund (611); designate and appropriate funds in the amount of \$1,400,000 from the available fund balance in the General Fund (001) and transfer to the Capital Replacement Fund (317) and appropriate to the Recreational and Cultural (REC) Center Remodel and expansion (Project QPC082) to provide funding for the associated Contract Award (ITB21-13); and

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PORT ORANGE, VOLUSIA COUNTY, FLORIDA:

Section 1. The funds for the City operating items are hereby appropriated as set forth in Composite Exhibit A, attached hereto, which reflects revenues and corresponding expenditures for the designated expenditures.

Section 2. The Budget item adopted in the preceding section shall govern the expenditures relating to such operations for the City during the current fiscal year effective October 1, 2020 through September 30, 2021.

Section 3. Supplemental appropriations, reductions of appropriations,

Page 284 of

emergency appropriations, and interdepartmental transfers of appropriations may be effected by the City Council and the City Manager as deemed necessary in strict compliance with the procedures specified in Chapter 2, Article VI, Division 3, Code of Ordinances, City of Port Orange, Florida.

Section 4. This resolution shall become effective immediately upon adoption.

MAYOR DONALD O. BURNETTE

ATTEST:

Robin L. Fenwick, MMC City Clerk

Adopted on the _____ day of _____

Reviewed and Approved: _____
Matthew J. Jones, City Attorney

FY2021 Recreation Impact Fee (611)
Prepared: April 28, 2021
Finance: Finance Staff

	<u>Budget Increase / (Decrease)</u>
<u>Revenues:</u>	
Other Financing Sources - Appropriated Fund Balance	1,240,000
Total Revenues:	<u>\$ 1,240,000</u>
<u>Expenditures:</u>	
Capital Outlay	1,240,000
Total Expenditures:	<u>\$ 1,240,000</u>

To budget to appropriate Fund balance in the Recreation Impact Fund (611) to provide additional funding for the construction contract and appropriate to Capital Outlay - Project QPC082

FY2021 General Fund (001)
Prepared: April 28, 2021
Finance: Finance Staff

	Budget Increase / (Decrease)
<u>Revenues:</u>	
Other Financing Sources - Appropriated Fund Balance	1,400,000
Total Revenues:	\$ 1,400,000

<u>Expenditures:</u>	
Interfund Transfer Expense	1,400,000
Total Expenditures:	\$ 1,400,000

To budget to appropriate Fund balance in the General Fund (001) and transfer to the General Capital Replacement Fund (317) to provide additional funding for the construction contract (ITB21-13) for the REC Remodel and Expansion Project (QPC082)

FY2021 General Capital Replacement Fund (317)
Prepared: April 28, 2021
Finance: Finance Staff

	<u>Budget Increase / (Decrease)</u>
<u>Revenues:</u>	
Other Financing Sources - Interfund Transfer Revenue	1,400,000
Total Revenues:	<u>\$ 1,400,000</u>
<u>Expenditures:</u>	
Capital Outlay -	1,400,000
Total Expenditures:	<u>\$ 1,400,000</u>

To budget to for a Transfer from the General Fund and appropriate to Capital Outlay to provide additional funding for the construction contract for the REC Center Remodel and expansion project (QPC082)



CITY COUNCIL AGENDA ITEM

REQUESTED COUNCIL MEETING DATE 5/18/2021

Consent item: No

SUBJECT: (G20b) Award of ITB #21-13 to Saboungi Construction Corporation for renovation and expansion of the REC

DEPARTMENT: Parks & Recreation

GOAL: Quality of Life

RECOMMENDED MOTION: Move to approve the contract award to Saboungi Construction for \$3,963,162 and authorize an allowance for unforeseen conditions (contingency) in an amount not to exceed \$317,052.00, subject to approval of Resolution No. 21-22; and authorize the Mayor and City Clerk to execute the associated documents.

SUMMARY: On April 19, 2021, five bids were submitted for the renovation and expansion of the REC. Saboungi Construction Inc. submitted a final and best bid under our local preference guidelines of **\$3,963,162.00**. This includes the base work and the five alternates that are outlined in the bid tab attached to this item. In addition, staff is requesting City Council authorize an allowance for unforeseen conditions up to \$317,053.00 (Contingency). The project will also require \$60,000 for inspection services, bringing the total project cost to **\$4,340,215**. The project is expected to take 305 days to build.

The project is over budget by \$1.4 million and staff has identified this additional funding in unrestricted fund balance which is included in a separate item as a budget resolution. Staff did look at different alternatives to reduce the shortfall but due to grant restrictions and the unknowns of COVID- 19 impacts on the economy, we are recommending moving forward with the project. Staff met with the design professional and the City's Facilities Manager to discuss the shortfall and it has been determined that because the estimate is one year old, the present state of the economy and construction cost escalations are the probable cause that the bids came in substantially higher than anticipated. Dana Smith with DJ Design will be present to answer any questions in reference to the technical specs and pricing.

This project will be funded in QPC 082. The project includes \$800,000 in Volusia ECHO Grants and \$50,000 from the Daytona Racing and Rec District. The remaining \$175,000 balance in the racing and rec grant will be allocated once the playground is designed and priced.

Attached for your review are Saboungi's submittal, the Bid tabulation form, and a copy of the ITB, addendum 1 & 2, and the intent to award.

Project No.: QPC082
QPC082

Funding Account No.: CAPITAL OUTLAY
CAPITAL OUTLAY

Presenter: Susan Lovallo

ATTACHMENTS:

1.	A101-2017 - AIA for ITB 21-13 Rec Remodel and Expansion - Final - (1) (1)	A101-2017 - AIA for ITB 21-13 Rec Remodel and Expansion - Final - (1) (1).pdf
2.	A201-2017 - AIA General Conditions - Final	A201-2017 - AIA General Conditions - Final.pdf
3.	ITB 21-13 Attachments to AIA	ITB 21-13 Attachments to AIA.pdf
4.	ITB 21-13 Bid Tabulation Sheet FINAL 4.26.21	ITB 21-13 Bid Tabulation Sheet FINAL 4.26.21.xlsx
5.	ITB 21-13 RENOVATION FINAL 3.9.21	ITB 21-13 RENOVATION FINAL 3.9.21.pdf
6.	Addendum 1 ITB #21-13 Renovation and Expansion of the REC FINAL 3.30.21	Addendum 1 ITB #21-13 Renovation and Expansion of the REC FINAL 3.30.21.pdf
7.	REC Addendum No.2 FINAL (4.12.2021)	REC Addendum No.2 FINAL (4.12.2021).pdf
8.	Saboungi Construction, Inc. Bid Submittal 4.19.21	Saboungi Construction, Inc. Bid Submittal 4.19.21.pdf
9.	ITB 21-13 NOTICE of INTENT 4.27.21	ITB 21-13 NOTICE of INTENT 4.27.21.pdf
10.	Award Letter ECHO 19-11 REC Center Phase I	Award Letter ECHO 19-11 REC Center Phase I.pdf
11.	Fully Executed Grants In Aid Agreement ECHO 19-11	Fully Executed Grants In Aid Agreement ECHO 19-11.pdf
12.	ECHO20-10 NTP & Fully Executed Agreement REC Center Phase II	ECHO20-10 NTP & Fully Executed Agreement REC Center Phase II.pdf
13.	DBRRFD Award Letter REC Center Indoor Playground	DBRRFD Award Letter REC Center Indoor Playground.pdf

Susan Lovallo
 Susan Lovallo
 Sandy Woodman
 Alison Sylvester
 Amanda Lasecki
 Lupe Reyna-Coffin
 Scott Neils
 Matthew Jones
 Wayne Clark
 Robin Fenwick

Created/Initiated - 4/27/2021
 Approved - 4/27/2021
 Approved - 4/27/2021
 Approved - 4/29/2021
 Approved - 4/29/2021
 Approved - 4/29/2021
 Approved - 4/30/2021
 Approved - 5/7/2021
 Approved - 5/11/2021
 Final Approval - 5/11/2021

AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the day of in the year 2021
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

CITY OF PORT ORANGE
1000 City Center Circle
Port Orange, FL 32129

and the Contractor:

SABOUNGI CONSTRUCTION, INC.
290A North US HIGHWAY 1
ORMOND BEACH, FLORIDA 32174

for the following Project:

ITB 21-13 Rec Remodel and Expansion

Renovation and expansion of the Rec

The Architect:

DJ DESIGN, INC. ARCHITECTS AND PLANNERS
913 North Nova Road
Holly Hill, FL 32117

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

TABLE OF ARTICLES

1	THE CONTRACT DOCUMENTS
2	THE WORK OF THIS CONTRACT
3	DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
4	CONTRACT SUM
5	PAYMENTS
6	DISPUTE RESOLUTION
7	TERMINATION OR SUSPENSION
8	MISCELLANEOUS PROVISIONS
9	ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

- ☐ The date of this Agreement.
- ☒ A date set forth in a notice to proceed issued by the Owner.
- ☐ Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

- ☐ Not later than () calendar days from the date of commencement of the Work.

Init.

[X] By the following date: Contractor shall achieve Substantial Completion of the work not later than 275 days from the issuance of a written Notice to Proceed by the City, and Final Completion 30 days thereafter.

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
N/A	N/A

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be Three Million, Nine Hundred Sixty-Three Thousand, One Hundred Sixty-Two and 00/100 Dollars (\$ 3,963,162.00), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price/Total Unit Cost:
Alternate No. 1: Remove & Replace Existing ACU/AHU Equipment in Gym #1	\$119,610.00
Alternate No. 2: Provide Welded Extruded Walkway Cover & Foundation	\$ 48,423.00
Alternate No. 3: Provide U.V. Filtration System in the new HVAC Systems	\$ 8,159.00
Alternate No. 4: Provide Automatic Hands-Free Flush Valves on Urinals & Water Closets, Automatic Hands-Free Soap & Paper Towel Dispensers	\$ 13,670.00
Alternate No. 5: Provide Indoor Play-Structure	\$ 50,000.00

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
N/A	N/A	N/A

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price
N/A	N/A

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
1. Total Unit Cost for Mobilization	Lump Sum	\$ 126,700.00

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User Notes:

2. Total Unit Cost for Demolition	Lump Sum	\$ 55,000.00
3. Total Unit Cost for General Construction	Lump Sum	\$3,541,600.00

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

\$500.00 per day.

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

N/A

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Contractor shall provide to the Owner fully executed Waiver and Partial Release from Contractor, Waiver and Partial Releases from Contractor's Subcontractors, Sub-subcontractor, suppliers, and materialmen or any party with lien rights, and Contractor's Affidavit of Outstanding Accounts at the time each Application for Payment is submitted. Based upon Applications for Payment submitted to the Architect by the Contractor in the form attached as Exhibit "D" and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents. Copies of the required Waiver and Partial Release from Contractor, Waiver and Partial Releases from Contractor's Subcontractors, Sub-subcontractors, suppliers and materialmen or any party with lien rights, and Contractor's Affidavit of Outstanding Accounts are attached as Composite Exhibit "E."

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the 1st day of a month, and the Contractor obtains Architect's certification of the application for payment within 10 days thereafter, then the Owner shall make payment of the amount certified to the Contractor not later than the 10th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, and the Contractor obtains Architect's certification of the application for payment within 10 days thereafter, then payment of the amount certified shall be made by the Owner not later than 30 days after the Architect receives the Application for Payment.

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

Init.

- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

Five percent (5%)

§ 5.1.7.1.1 The following items are not subject to retainage:

N/A

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(Paragraph deleted)

No reduction of retainage below five percent (5%).

§ 5.1.7.3

Deleted in its entirety

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

Init.

/

All payments shall be governed by the Local Government Prompt Payment Act as set forth in Sections 218.70 through 218.79, Florida Statutes, as amended.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

(Paragraphs deleted)

Architect's actions, subject to recommendation to Owner, and Owner approval prior to action.

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

☐ Arbitration pursuant to Section 15.4 of AIA Document A201–2017

☒ Litigation in a court of competent

(Paragraphs deleted)

jurisdiction. If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims shall be resolved by litigation, and shall have its venue located exclusively in the Circuit Court of Volusia County, Florida, and the Parties hereby expressly consent and submit themselves to the personal jurisdiction and venue of the Court.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017, as modified by Owner.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

(Paragraph deleted)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017, as modified by Owner.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:

Susan Lovallo, Parks and Recreation Director
1000 City Center Circle
Port orange, Florida 32129
(386) 506-5852 - Telephone
slovallo@port-orange.org

§ 8.3 The Contractor's representative:

Init.

Saboungi Construction, Inc.
290A North US Highway 1
Ormond Beach, Florida 32174
(386) 672-2077 - Telephone
info@saboungiconstruction.com

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
(Paragraph deleted)

§ 8.7 Other provisions:

§ 8.7.1 **PUBLIC RECORD COMPLIANCE** Contractor shall comply with public records laws as set forth in Section 119, Florida Statutes, and shall specifically: (a) keep and maintain public records that ordinarily and necessarily would be required by the City in order to perform the service; (b) provide the public with access to public records on the same terms and conditions that the City would provide the records at a cost that does not exceed the cost provided in Section 119, Florida Statutes, or as otherwise provided by law; (c) ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law; and (d) meet all requirements for retaining public records and transfer to the City, at no cost, all public records in possession of the Contractor upon termination of the Contract and destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. All records stored electronically must be provided to the City in a format that is compatible with the information technology systems of the City.

§ 8.7.2 RECORDS

The design, permits and all other records prepared by the Contractor, assembled for the City, subcontracted for the City, and any other records related to the scope of work in the possession of the Contractor shall be retained by the Contractor for the requisite time set forth in Florida Administration Code Rule 1 b-24

<http://dos.myflorida.com/library-archives/records-management/>. Contractor may dispose of the records in accordance with Florida law, upon receipt of a signed written release signed by the City Attorney. Contractor agrees to indemnify the City for failure to comply with the requirements of this paragraph including costs of litigation and legal fees incurred through all appeals. City reserves the right to select and approve the defense attorney.

§ 8.7.3 FORCE MAJEURE

Neither party shall be liable for any delay in performance or failure to perform any obligation hereunder if, and to the extent that, such failure or delay is caused by an event of Force Majeure. Force Majeure shall mean any act, event or condition that is beyond the party's reasonable control, that materially and adversely affects the party's ability to perform its obligations hereunder, and that is not the result of the party's willful neglect, error, omission or failure to exercise reasonable due diligence.

§ 8.7.4 CONTRACT CONSTRUCTION

This Contract may be executed in one or more counterparts, each of which shall be deemed an original but all of which together constitute one and the same instrument. The delivery by facsimile or e-mail of an executed copy of this Contract shall be deemed valid as if an original signature was delivered. No contract shall be formed between the Contractor and the City until both Parties have signed this Contract.

Init.

§ 8.7.5 FINANCIAL DISCLOSURES

During the term of this Contract, Contractor covenants and agrees that it will keep adequate books and records of accounts in accordance with Generally Accepted Accounting Principles (GAAP). Contractor further covenants and agrees that in the event the Contractor becomes insolvent and/or fails to pay its current obligations when they become due, Contractor shall so advise Owner of such situation and, upon request from the Owner, Contractor shall provide to Owner financial statements of Contractor, including current income and expense statements of Contractor, consolidated balance sheets signed by a financial officer of Contractor, and audited reports provided by Contractor to Contractor's Surety, audited financial statements certified by a Certified Public Accountant concerning the financial affairs of the Contractor and all affiliates of Contractor, and such other financial information requested by Owner. All such financial information shall comply with GAAP.

In the event that Contractor becomes insolvent and/or fails to pay its obligations when they become due, Contractor hereby authorized its sureties, lenders, financial institutions and other third parties to release Owner financial information requested by Owner, including, but not limited to, the financial information described in the preceding paragraph.

§ 8.7.6 WAIVER OF JURY TRIAL

All parties hereby waive any and all right to any trial by jury in any action or proceeding arising directly or indirectly hereunder.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, as modified by Owner with attached Exhibits "A" through "F," all of which are made a part hereof by this reference.
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction
- .4 Specifications: ITB 21-13 Specifications* as contained in ITB 21-13, Section 3, pages 13 – 641.
* ITB 21-13 Specifications and BID SET Drawings AS IDENTIFIED IN ITB 21-13, SUBJECT TO ADDENDUM NO. 1 AND ADDENDUM NO. 2. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THEY ARE UTILITIZING THE CURRENT SPECIFICATION AND DRAWING INFORMATION. ANY QUESTIONS SHOULD BE DIRECTED TO THE ARCHITECT OF RECORD, Dana Smith.
- .5 Drawings: ITB 21-13 "Attachment A" BID SET Drawings* as contained in ITB 21-13.
* ITB 21-13 Specifications and BID SET Drawings AS IDENTIFIED IN ITB 21-13, SUBJECT TO ADDENDUM NO. 1 AND ADDENDUM NO. 2. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THEY ARE UTILITIZING THE CURRENT SPECIFICATION AND DRAWING INFORMATION. ANY QUESTIONS SHOULD BE DIRECTED TO THE ARCHITECT OF RECORD, Dana Smith.
- .6 Addenda, if any:

Number	Date	Pages
Addendum No. 1	March 30, 2021	4
Addendum No. 2	April 12, 2021	3

(Paragraphs deleted)

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

- .7 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

[] The Sustainability Plan:

Title	Date	Pages
-------	------	-------

[] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
----------	-------	------	-------

- .8 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

Donald O. Burnette, Mayor

(Row deleted)

CONTRACTOR (Signature)

Hassan Sabounji, Vice President

Additions and Deletions Report for AIA® Document A101® – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 16:41:59 ET on 05/06/2021.

PAGE 1

AGREEMENT made as of the day of in the year 2021

...

CITY OF PORT ORANGE
1000 City Center Circle
Port Orange, FL 32129

and the Contractor:

~~(Name, legal status, address and other information)~~

SABOUNGI CONSTRUCTION, INC.
290A North US HIGHWAY 1
ORMOND BEACH, FLORIDA 32174

...

~~(Name, location and detailed description)~~
ITB 21-13 Rec Remodel and Expansion

...

Renovation and expansion of the Rec

...

~~(Name, legal status, address and other information)~~
DJ DESIGN, INC. ARCHITECTS AND PLANNERS
913 North Nova Road
Holly Hill, FL 32117

PAGE 2

~~(Check one of the following boxes.)~~

...

☒ A date set forth in a notice to proceed issued by the Owner.

...

~~(Check one of the following boxes and complete the necessary information.)~~

PAGE 3

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User Notes:

[**X**] By the following date: Contractor shall achieve Substantial Completion of the work not later than 275 days from the issuance of a written Notice to Proceed by the City, and Final Completion 30 days thereafter.

...

N/A

N/A

...

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be Three Million, Nine Hundred Sixty-Three Thousand, One Hundred Sixty-Two and 00/100 Dollars (\$ 3,963,162.00), subject to additions and deductions as provided in the Contract Documents.

Item	Price	Price/Total Unit Cost:
<u>Alternate No. 1: Remove & Replace Existing ACU/AHU Equipment in Gym #1</u>	<u>\$119,610.00</u>	
<u>Alternate No. 2: Provide Welded Extruded Walkway Cover & Foundation</u>	<u>\$ 48,423.00</u>	
<u>Alternate No. 3: Provide U.V. Filtration System in the new HVAC Systems</u>	<u>\$ 8,159.00</u>	
<u>Alternate No. 4: Provide Automatic Hands-Free Flush Valves on Urinals & Water Closets, Automatic Hands-Free Soap & Paper Towel Dispensers</u>	<u>\$ 13,670.00</u>	
<u>Alternate No. 5: Provide Indoor Play-Structure</u>	<u>\$ 50,000.00</u>	

...

N/A

N/A

N/A

...

N/A

N/A

<u>1. Total Unit Cost for Mobilization</u>	<u>Lump Sum</u>	<u>\$ 126,700.00</u>
<u>2. Total Unit Cost for Demolition</u>	<u>Lump Sum</u>	<u>\$ 55,000.00</u>
<u>3. Total Unit Cost for General Construction</u>	<u>Lump Sum</u>	<u>\$3,541,600.00</u>

PAGE 4

\$500.00 per day.

...

N/A

§ 5.1.1 Contractor shall provide to the Owner fully executed Waiver and Partial Release from Contractor, Waiver and Partial Releases from Contractor's Subcontractors, Sub-subcontractor, suppliers, and materialmen or any party with lien rights, and Contractor's Affidavit of Outstanding Accounts at the time each Application for Payment is submitted. Based upon Applications for Payment submitted to the Architect by the Contractor in the form attached as Exhibit "D" and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents. Copies of the required Waiver and Partial Release from Contractor, Waiver and Partial Releases from Contractor's Subcontractors, Sub-subcontractors, suppliers and materialmen or any party with lien rights, and Contractor's Affidavit of Outstanding Accounts are attached as Composite Exhibit "E."

...

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the 1st day of a month, and the Contractor obtains Architect's certification of the application for payment within 10 days thereafter, then the Owner shall make payment of the amount certified to the Contractor not later than the 10th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, and the Contractor obtains Architect's certification of the application for payment within 10 days thereafter, then payment of the amount certified shall be made by the Owner not later than (—)30 days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This ~~schedule of values~~ schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

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(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

Five percent (5%)

...

(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

N/A

...

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

No reduction of retainage below five percent (5%).

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

(Insert any other conditions for release of retainage upon Substantial Completion.)

Deleted in its entirety

PAGE 6

(Insert rate of interest agreed upon, if any.)

—%—All payments shall be governed by the Local Government Prompt Payment Act as set forth in Sections 218.70 through 218.79, Florida Statutes, as amended.

...

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

Architect's actions, subject to recommendation to Owner, and Owner approval prior to action.

...

☒ Litigation in a court of competent jurisdiction

☐ Other (Specify)

jurisdiction. If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims ~~will be resolved by litigation in a court of competent jurisdiction~~ shall be resolved by litigation, and shall have its venue located exclusively in the Circuit Court of Volusia County, Florida, and the Parties hereby expressly consent and submit themselves to the personal jurisdiction and venue of the Court.

...

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201-2017. A201-2017, as modified by Owner.

...

(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

...

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201-2017. A201-2017, as modified by Owner.

...

~~(Name, address, email address, and other information)~~

Susan Lovallo, Parks and Recreation Director
1000 City Center Circle
Port orange, Florida 32129
(386) 506-5852 - Telephone
slovallo@port-orange.org

...

~~(Name, address, email address, and other information)~~

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User Notes:

Saboungi Construction, Inc.
290A North US Highway 1
Ormond Beach, Florida 32174
(386) 672-2077 - Telephone
info@saboungiconstruction.com

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(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

...

§ 8.7.1 PUBLIC RECORD COMPLIANCE Contractor shall comply with public records laws as set forth in Section 119, Florida Statutes, and shall specifically: (a) keep and maintain public records that ordinarily and necessarily would be required by the City in order to perform the service; (b) provide the public with access to public records on the same terms and conditions that the City would provide the records at a cost that does not exceed the cost provided in Section 119, Florida Statutes, or as otherwise provided by law; (c) ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law; and (d) meet all requirements for retaining public records and transfer to the City, at no cost, all public records in possession of the Contractor upon termination of the Contract and destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. All records stored electronically must be provided to the City in a format that is compatible with the information technology systems of the City.

§ 8.7.2 RECORDS

The design, permits and all other records prepared by the Contractor, assembled for the City, subcontracted for the City, and any other records related to the scope of work in the possession of the Contractor shall be retained by the Contractor for the requisite time set forth in Florida Administration Code Rule 1 b-24

<http://dos.myflorida.com/library-archives/records-management/>. Contractor may dispose of the records in accordance with Florida law, upon receipt of a signed written release signed by the City Attorney. Contractor agrees to indemnify the City for failure to comply with the requirements of this paragraph including costs of litigation and legal fees incurred through all appeals. City reserves the right to select and approve the defense attorney.

§ 8.7.3 FORCE MAJEURE

Neither party shall be liable for any delay in performance or failure to perform any obligation hereunder if, and to the extent that, such failure or delay is caused by an event of Force Majeure. Force Majeure shall mean any act, event or condition that is beyond the party's reasonable control, that materially and adversely affects the party's ability to perform its obligations hereunder, and that is not the result of the party's willful neglect, error, omission or failure to exercise reasonable due diligence.

§ 8.7.4 CONTRACT CONSTRUCTION

This Contract may be executed in one or more counterparts, each of which shall be deemed an original but all of which together constitute one and the same instrument. The delivery by facsimile or e-mail of an executed copy of this Contract shall be deemed valid as if an original signature was delivered. No contract shall be formed between the Contractor and the City until both Parties have signed this Contract.

§ 8.7.5 FINANCIAL DISCLOSURES

During the term of this Contract, Contractor covenants and agrees that it will keep adequate books and records of accounts in accordance with Generally Accepted Accounting Principles (GAAP). Contractor further covenants and agrees that in the event the Contractor becomes insolvent and/or fails to pay its current obligations when they become due, Contractor shall so advise Owner of such situation and, upon request from the Owner, Contractor shall provide to Owner financial statements of Contractor, including current income and expense statements of Contractor, consolidated balance sheets signed by a financial officer of Contractor, and audited reports provided by Contractor to Contractor's Surety, audited financial statements certified by a Certified Public Accountant concerning the financial affairs of the Contractor and all affiliates of Contractor, and such other financial information requested by Owner. All such financial information shall comply with GAAP.

In the event that Contractor becomes insolvent and/or fails to pay its obligations when they become due, Contractor hereby authorized its sureties, lenders, financial institutions and other third parties to release Owner financial information requested by Owner, including, but not limited to, the financial information described in the preceding paragraph.

§ 8.7.6 WAIVER OF JURY TRIAL

All parties hereby waive any and all right to any trial by jury in any action or proceeding arising directly or indirectly hereunder.

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- .1 AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor, as modified by Owner with attached Exhibits "A" through "F," all of which are made a part hereof by this reference.

...

- .4 AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below: Specifications: ITB 21-13 Specifications* as contained in ITB 21-13, Section 3, pages 13 – 641.

* ITB 21-13 Specifications and BID SET Drawings AS IDENTIFIED IN ITB 21-13, SUBJECT TO ADDENDUM NO. 1 AND ADDENDUM NO. 2. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THEY ARE UTILITIZING THE CURRENT SPECIFICATION AND DRAWING INFORMATION. ANY QUESTIONS SHOULD BE DIRECTED TO THE ARCHITECT OF RECORD, Dana Smith.

(Insert the date of the E203-2013 incorporated into this Agreement.)

- .5 Drawings: ITB 21-13 "Attachment A" BID SET Drawings* as contained in ITB 21-13.

* ITB 21-13 Specifications and BID SET Drawings AS IDENTIFIED IN ITB 21-13, SUBJECT TO ADDENDUM NO. 1 AND ADDENDUM NO. 2. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THEY ARE UTILITIZING THE CURRENT SPECIFICATION AND DRAWING INFORMATION. ANY QUESTIONS SHOULD BE DIRECTED TO THE ARCHITECT OF RECORD, Dana Smith.

- .5 Drawings, .6 Addenda, if any:

Number	Title	Date	Pages
Addendum No. 1		March 30, 2021	4
Addendum No. 2		April 12, 2021	3

- .6 Specifications

Section	Title	Date	Pages
---------	-------	------	-------

- .7 Addenda, if any:

Number	Date	Pages
--------	------	-------

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- .8 .7 Other Exhibits:

.9

- .8 Other documents, if any, listed below:

...

Donald O. Burnette, Mayor

(Printed name and title)

Hassan Saboungi, Vice President

(Printed name and title)



Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, _____, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 16:41:59 ET on 05/06/2021 under Order No. 7802552229 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A101™ – 2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)



AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Paragraphs deleted)

ITB 21-13 Rec Remodel and Expansion

THE OWNER:

CITY OF PORT ORANGE
1000 City Center Circle
Port Orange, FL 32129

THE ARCHITECT:

DJ DESIGN, INC. ARCHITECTS AND PLANNERS
913 North Nova Road
Holly Hill, FL 32117

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4	ARCHITECT
5	SUBCONTRACTORS
6	CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
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15	CLAIMS AND DISPUTES

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

Init.

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act

or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

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The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and

approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

Additions and Deletions Report for

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ITB 21-13 Rec Remodel and Expansion

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~~(Name, legal status and address)~~

CITY OF PORT ORANGE
1000 City Center Circle
Port Orange, FL 32129

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~~(Name, legal status and address)~~

DJ DESIGN, INC. ARCHITECTS AND PLANNERS
913 North Nova Road
Holly Hill, FL 32117

Certification of Document's Authenticity

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I, _____, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 16:32:04 ET on 05/06/2021 under Order No. 7802552229 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2017, General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)

ITB 21-13

Specifications

Renovation and Expansion of the Rec

Consisting of 630 Pages

SPECIFICATIONS

for

THE REC

Project #02354.20

DJdesign Services, Inc.

ARCHITECTS & PLANNERS

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Holly Hill, FL 32117**

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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. Project Identification: The REC.

B. Owner: City of Port Orange.

1. Owner's Representative: Susan Lovallo.

C. Architect: DJdesign Services, Inc.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. Drawings and Specifications.

B. Type of Contract.

1. Project will be constructed under a single prime contract.

C. General Conditions:

1. City of Port Orange, Standard Service Agreement.

1.4 PHASED CONSTRUCTION

- A. Construction work in the building shall be done without disturbance to adjacent ongoing activities. Access shall remain unimpeded during construction.

1.5 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7 a.m. to 5 p.m., Monday through Friday, except as otherwise indicated.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor air intakes.
- F. Controlled Substances: Use of tobacco products and other controlled substances on the Project site is not permitted.
- G. Owner shall reserve the right to remove contractor's personnel from jobsite who are deemed not to have the best interest of the owner.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ADDITIVE ALTERNATES

1. Alternate No. 1: Remove and replace existing ACU/AHU equipment in Gym #1.
2. Alternate No. 2: Provide welded extruded walkway cover and foundation.
3. Alternate No. 3: Provide U.V. Filtration System in the new HVAC systems.
4. Alternate No. 4: Provide automatic handsfree flush valves on urinals and water closets, automatic handsfree soap and paper towel dispensers.
5. Alternate No. 5: Provide indoor play-structure allowances of \$50,000.00

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Section:
 - 1. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1.3 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A or similar form.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication, or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

- i. Research reports evidencing compliance with building code in effect for Project, from Florida Building Code.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution will not adversely affect Contractor's construction schedule.

- c. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - d. Requested substitution is compatible with other portions of the Work.
 - e. Requested substitution has been coordinated with other portions of the Work.
 - f. Requested substitution provides specified warranty.
 - g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed, unless otherwise indicated.
- C. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Requests for Information (RFIs).
 - 2. Owner/Architect/Contractor Project meetings. (OAC)

1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during construction.
- B. OAC: Owner, Architect and Contractor meetings held on a regular basis.

1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.

5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities.

1.4 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Drawing number and detail references, as appropriate.
 9. Field dimensions and conditions, as appropriate.
 10. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 11. Contractor's signature.
 12. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- D. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly.

1.5 PROJECT MEETINGS (OAC)

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
 1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.

- k. Preparation of record documents.
 - l. Use of the premises and existing building.
 - m. Work restrictions.
 - n. Working hours.
 - o. Owner's occupancy requirements.
 - p. Responsibility for temporary facilities and controls.
 - q. Procedures for moisture and mold control.
 - r. Procedures for disruptions and shutdowns.
 - s. Construction waste management and recycling.
 - t. Parking availability.
 - u. Office, work, and storage areas.
 - v. Equipment deliveries and priorities.
 - w. First aid.
 - x. Security.
 - y. Progress cleaning.
3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Progress Meetings: Conduct progress meetings at biweekly intervals.

- 1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
- 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.

- 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Daily construction reports.
 - 3. Field condition reports.
- B. Related Section:
 - 1. Division 01 Section "Multiple Contract Summary" for preparing a combined Contractor's Construction Schedule.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. PDF electronic file.
 - 2. Two paper copies.
- B. Start-up Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 3. Total Float Report: List of all activities sorted in ascending order of total float.
- E. Daily Construction Reports: Submit at weekly intervals.
- F. Field Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's construction schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 1. Secure time commitments for performing critical elements of the Work from entities involved.
 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.

2. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 3. Startup and Testing Time: Include not less than 15 days for startup and testing.
 4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 5. Punch List and Final Completion: Include not more than 30 days for punch list and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 5. Work Stages: Indicate important stages of construction for each major portion of the Work.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered RFIs.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
- F. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule.
- G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice of Award.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. Equipment at Project site.
 - 5. Material deliveries.
 - 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 - 7. Accidents.
 - 8. Meetings and significant decisions.
 - 9. Unusual events.
 - 10. Stoppages, delays, shortages, and losses.
 - 11. Meter readings and similar recordings.
 - 12. Emergency procedures.
 - 13. Orders and requests of authorities having jurisdiction.
 - 14. Change Orders received and implemented.
 - 15. Construction Change Directives received and implemented.
 - 16. Services connected and disconnected.
 - 17. Equipment or system tests and startups.
 - 18. Partial completions and occupancies.
 - 19. Substantial Completions authorized.
- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections:
 - 1. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 2. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 3. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
 - 1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.

- a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Contractor shall execute a data licensing agreement in the form of an Agreement form acceptable to the Owner and Architect.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's Construction Manager's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect
 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).

- j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Other necessary identification.
- E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
 - 1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01A).
 - 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
 - 4. Include the following information on an inserted cover sheet:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of firm or entity that prepared submittal.
 - g. Name of subcontractor.
 - h. Name of supplier.
 - i. Name of manufacturer.
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Other necessary identification.
- F. Options: Identify options requiring selection by the Architect.
- G. Deviations: Identify deviations from the Contract Documents on submittals.
- H. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 - 1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
- I. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- L. Use for Construction: Use only final submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements:
1. Submit electronic submittals via email as PDF electronic files.
 - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 2. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
 4. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based upon Architect's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 42 inches (750 by 1067 mm).
 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.

- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit two sets of Samples. Architect will retain one Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project record sample.
 - 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Submit product schedule in the following format:
 - a. PDF electronic file.
- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."
- H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A.
 1. Submit subcontractor list in the following format:
 - a. PDF electronic file.
 - b. Number of Copies: Three paper copies of subcontractor list, unless otherwise indicated. Architect will return two copies.
 - c. List shall include the following trades:
 - Selective Demolition
 - Landscaping/Irrigations
 - Metal Stud Framing and Dry Wall
 - Acoustical Grid and Ceiling Tile
 - Millwork
 - Membrane Roofing and Accessories
 - Plumbing
 - HVAC
 - Electrical
 - Painting
 - Flooring
 - Concrete Placement and Finishing
 - Aluminum Storefront Systems
 - Rough Carpentry
 - Structural Steel Fabrications and Installation
- J. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

- M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- R. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- T. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
 - 1. Reviewed
 - 2. Rejected
 - 3. Submit Specific Item

4. Furnish as corrected
 5. Revise and Re-Submit.
- C. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it or will return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.
- D. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections:
 - 1. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Laboratory Mockups: Full-size, physical assemblies constructed at testing facility to verify performance characteristics.
- D. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of FIVE previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.
 - 1. Seismic-force resisting system, designated seismic system, or component listed in the designated seismic system quality assurance plan prepared by the Architect.

2. Main wind-force resisting system, or a wind-resisting component listed in the wind-force-resisting system quality assurance plan prepared by the Architect.
- B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
 1. Name, address, and telephone number of representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

- B. **Manufacturer Qualifications:** A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. **Fabricator Qualifications:** A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. **Installer Qualifications:** A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. **Professional Engineer Qualifications:** A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. **Specialists:** Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. **Testing Agency Qualifications:** An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. **Manufacturer's Representative Qualifications:** An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. **Preconstruction Testing:** Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.

- d. When testing is complete, remove test specimens, assemblies, mockups do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ABAA	Air Barrier Association of America
ABMA	American Bearing Manufacturers Association
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association (Now part of CPA)
AHAM	Association of Home Appliance Manufacturers

AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)
ALSC	American Lumber Standard Committee, Incorporated
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	Architectural Precast Association
APA	APA - The Engineered Wood Association
APA EWS	APA - The Engineered Wood Association; Engineered Wood Systems (See APA - The Engineered Wood Association)
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASCE	American Society of Civil Engineers
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International (American Society of Mechanical Engineers International)
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (American Society for Testing and Materials International)
AWCI	Association of the Wall and Ceiling Industry

AWCMA	American Window Covering Manufacturers Association (Now WCMA)
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association (Formerly: American Wood Preservers' Association)
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BICSI	BICSI, Inc.
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
BISSC	Baking Industry Sanitation Standards Committee
BWF	Badminton World Federation (Formerly: IBF - International Badminton Federation)
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Canadian Electricity Association
CEA	Consumer Electronics Association
CFFA	Chemical Fabrics & Film Association, Inc.
CGA	Compressed Gas Association
CIMA	Cellulose Insulation Manufacturers Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CRRC	Cool Roof Rating Council
CPA	Composite Panel Association
CPPA	Corrugated Polyethylene Pipe Association

CRI	Carpet and Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CSA	CSA International (Formerly: IAS - International Approval Services)
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DHI	Door and Hardware Institute
EIA	Electronic Industries Alliance
EIMA	EIFS Industry Members Association
EJCDC	Engineers Joint Contract Documents Committee
EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association (Electrostatic Discharge Association)
ETL SEMCO	Intertek ETL SEMCO (Formerly: ITS - Intertek Testing Service NA)
FIBA	Federation Internationale de Basketball (The International Basketball Federation)
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FM Approvals	FM Approvals LLC
FM Global	FM Global (Formerly: FMG - FM Global)
FMRC	Factory Mutual Research (Now FM Global)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.

FSA	Fluid Sealing Association
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Part of GSI)
GS	Green Seal
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)
HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation (Now BWF)
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IEST	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
ILI	Indiana Limestone Institute of America, Inc.
ISO	International Organization for Standardization Available from ANSI

ISSFA	International Solid Surface Fabricators Association
ITS	Intertek Testing Service NA (Now ETL SEMCO)
ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LMA	Laminating Materials Association (Now part of CPA)
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.
MFMA	Metal Framing Manufacturers Association, Inc.
MH	Material Handling (Now MHIA)
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International (National Association of Corrosion Engineers International)
NADCA	National Air Duct Cleaners Association
NAGWS	National Association for Girls and Women in Sport
NAIMA	North American Insulation Manufacturers Association
NBGQA	National Building Granite Quarries Association, Inc.
NCAA	National Collegiate Athletic Association (The)
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute

NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	NFPA (National Fire Protection Association)
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association)
NOMMA	National Ornamental & Miscellaneous Metals Association
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)
NWWDA	National Wood Window and Door Association (Now WDMA)
OPL	Omega Point Laboratories, Inc. (Now ITS)
PCI	Precast/Prestressed Concrete Institute

PDCA	Painting & Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PLANET	Professional Landcare Network (Formerly: ACLA - Associated Landscape Contractors of America)
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
SAE	SAE International
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers (See ASCE)
SGCC	Safety Glazing Certification Council
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMPTE	Society of Motion Picture and Television Engineers
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)
SPIB	Southern Pine Inspection Bureau (The)

SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TCA	Tile Council of America, Inc. (Now TCNA)
TCNA	Tile Council of North America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society
TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball
USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)

WIC	Woodwork Institute of California (Now WI)
WMMPA	Wood Moulding & Millwork Producers Association
WSRCA	Western States Roofing Contractors Association
WWPA	Western Wood Products Association

- C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

IAPMO	International Association of Plumbing and Mechanical Officials
ICC	International Code Council
ICC-ES	ICC Evaluation Service, Inc.
UBC	Uniform Building Code (See ICC)

- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE	Army Corps of Engineers
CPSC	Consumer Product Safety Commission
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FDA	Food and Drug Administration
GSA	General Services Administration
HUD	Department of Housing and Urban Development
LBL	Lawrence Berkeley National Laboratory
NCHRP	National Cooperative Highway Research Program

(See TRB)

NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration
PBS	Public Buildings Service (See GSA)
PHS	Office of Public Health and Science
RUS	Rural Utilities Service (See USDA)
SD	State Department
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from U.S. Access Board
CFR	Code of Federal Regulations Available from Government Printing Office
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point
DSCC	Defense Supply Center Columbus (See FS)
FED-STD	Federal Standard (See FS)
FS	Federal Specification Available from Department of Defense Single Stock Point Available from Defense Standardization Program Available from General Services Administration

Available from National Institute of Building Sciences

FTMS Federal Test Method Standard
(See FS)

MIL (See MILSPEC)

MIL-STD (See MILSPEC)

MILSPEC Military Specification and Standards
Available from Department of Defense Single Stock Point

UFAS Uniform Federal Accessibility Standards
Available from Access Board

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CBHF State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation

CCR California Code of Regulations

CPUC California Public Utilities Commission

TFS Texas Forest Service
Forest Resource Development

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Section:
 - 1. Division 01 Section "Substitution Procedures" for requests for substitutions.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable

product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
- b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

- B. Delivery and Handling:

- 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
- 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
- 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

- C. Storage:

- 1. Store products to allow for inspection and measurement of quantity or counting of units.
- 2. Store materials in a manner that will not endanger Project structure.
- 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- 4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
- 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- 6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
 - 1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered, unless otherwise indicated.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
 4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered, unless otherwise indicated.
 - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Recycling nonhazardous demolition and construction waste.
 - 2. Disposing of nonhazardous demolition and construction waste.
- B. Related Sections:
 - 1. Division 02 Section "Selective Structure Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements, and for disposition of hazardous waste.
 - 2. Division 04 Section "Unit Masonry" for disposal requirements for masonry waste.

1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total non-hazardous solid waste generated by the Work. Facilitate recycling and salvage of materials.

1.4 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 7 days of date established for the Notice to Proceed.

1.5 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in tons.
 - 4. Quantity of waste salvaged, both estimated and actual in tons.
 - 5. Quantity of waste recycled, both estimated and actual in tons.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- C. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- D. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- E. Qualification Data: For waste management coordinator.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.6 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements of this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate

quantities by weight or volume, but use same units of measure throughout waste management plan.

- B. Waste Identification: Indicate anticipated types and quantities of demolition and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.

C. Salvaged Items for Owner's Use:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site off-site designated by Owner.
5. Protect items from damage during transport and storage.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 1. Pulverize concrete to maximum 1-1/2-inch (38-mm) size.
- B. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 1. Pulverize masonry to maximum 1-1/2-inch (38-mm) size.
 2. Clean and stack undamaged, whole masonry units on wood pallets.
- C. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- D. Metals: Separate metals by type.
 1. Structural Steel: Stack members according to size, type of member, and length.
 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- E. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- F. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- G. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- H. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- I. Carpet: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 1. Store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- J. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- K. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees at landfill facility.

C. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

D. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.6 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

D. Disposal: Transport waste materials and dispose of at designated spoil areas on Owner's property.

E. Disposal: Transport waste materials off Owner's property and legally dispose of them.

3.7 SAMPLE FORMS

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
- B. Related Sections:
 - 1. Division 01 Section "Photographic Documentation" for submitting final completion construction photographic documentation.
 - 2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 4. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
 - 5. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 3. Submit list of incomplete items in the following format:
 - a. PDF electronic file.
 - b. Three paper copies, unless otherwise indicated. Architect will return two copies.

1.5 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 - 4. Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.

- m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - r. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

END OF SECTION 017700

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.
- B. Pre-Demolition Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.
- C. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.4 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Pre-Demolition Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.
- E. Hazardous Materials: It is unknown whether hazardous materials will be encountered in the Work.
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.
- F. Hazardous Materials: Hazardous materials are present in construction to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- G. Storage or sale of removed items or materials on-site is not permitted.
- H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
- F. Survey of Existing Conditions: Record existing conditions by use of measured drawings and preconstruction photographs.
- G. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
- B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 5. Dispose of demolished items and materials promptly.
- B. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- C. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 042200 - CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units (CMU's).
2. Steel reinforcing bars.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For reinforcing steel. Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength.
 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

1.3 QUALITY ASSURANCE

- A. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. CMUs: ASTM C 90.
 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi.
 2. Density Classification: Normal weight.

2.2 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of Portland cement and hydrated lime containing no other ingredients.
- D. Aggregate for Mortar: ASTM C 144.
 - 1. For joints, less than 1/4-inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
- E. Aggregate for Grout: ASTM C 404.
- F. Water: Potable.

2.3 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.
- B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
 - 1. Interior Walls: Hot-dip galvanized, carbon steel.
 - 2. Exterior Walls: Hot-dip galvanized, carbon steel.
 - 3. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.

2.4 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.
 - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
 - 2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
 - 3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.5 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use masonry cement or mortar cement mortar unless otherwise indicated.

- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
 - 1. For masonry below grade or in contact with earth, use Type S.
 - 2. For reinforced masonry, use Type S.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 - 2. Proportion grout in accordance with ASTM C 476, Table 1.
 - 3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 TOLERANCES

- A. Dimensions and Locations of Elements:
 - 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
 - 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
 - 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.
- B. Lines and Levels:
 - 1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
 - 2. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
- C. Joints:
 - 1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).

3.2 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets.

Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

3.3 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
 - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Lay solid masonry units with filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.4 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
 - 1. Space reinforcement not more than 16 inches o.c.
- B. Provide continuity at corners by using prefabricated L-shaped units.

3.5 REINFORCED UNIT MASONRY INSTALLATION

- A. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.

- B. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Limit height of vertical grout pours to not more than 60 inches.

3.6 FIELD QUALITY CONTROL

- A. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.7 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

END OF SECTION 042200

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes structural steel and grout.
- B. Related Sections:
 - 1. Division 05 Section Metal Stairs and Division 13 Metal Building Systems additional requirements for architecturally exposed structural steel.

1.2 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.3 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand loads indicated and comply with other information and restrictions indicated.
 - 1. Select and complete connections using details indicated and AISC 360.
 - 2. Use LRFD; data are given at factored-load level ASD; data are given at service-load level.
- B. Moment Connections: Type PR, partially restrained.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components.
- C. Qualification Data: For qualified fabricator.
- D. Welding certificates.
- E. Mill test reports for structural steel, including chemical and physical properties.
- F. Source quality-control reports.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC 303.
 - 2. AISC 360.
 - 3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- E. Preinstallation Conference: Conduct conference at Project site.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles, M, S-Shapes: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.
- E. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
- F. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with plain finish.
- B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH, (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 490 (ASTM F 959M, Type 10.9), compressible-washer type with plain finish.
- C. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- D. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.
 1. Finish: Plain.
- E. Threaded Rods: ASTM A 36/A 36M.
 1. Finish: Plain.

2.3 PRIMER

- A. Primer: Comply with Division 09 painting Sections.
- B. Primer: SSPC-Paint 25, Type I, zinc oxide, alkyd, linseed oil primer.
- C. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.4 GROUT

- A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.
- B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
- B. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
 2. Surfaces to be field welded.
 3. Surfaces to be high-strength bolted with slip-critical connections.
 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 5. Galvanized surfaces.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 1. SSPC-SP 2, "Hand Tool Cleaning."
 2. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.8 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- C. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 1. Liquid Penetrant Inspection: ASTM E 165.
 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 3. Ultrasonic Inspection: ASTM E 164.

4. Radiographic Inspection: ASTM E 94.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedment's for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Base Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 2. Weld plate washers to top of baseplate.
 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

3.4 FIELD QUALITY CONTROL

- A. Bolted Connections: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- B. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.
- C. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

END OF SECTION 051200

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Exterior Non-Load-Bearing Wall-Framing
 - 2. Roof Trusses.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads:
 - a. Dead Loads: Weights of materials and construction 5 psf.
 - b. Live Loads: 20 psf.
 - c. Roof Loads: Secondary framing 20 psf.
 - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/240 of the wall height.
 - b. Roof sub-framing: Vertical deflection of 1/240 of the span.

1.3 SUBMITTALS

- A. Product Data: For each type of product and accessory indicated.
- B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 - 1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Welding certificates.
- D. Qualification data.
- E. Product test reports.

- F. Research/evaluation reports.

1.4 QUALITY ASSURANCE

- A. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements.
- B. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code--Sheet Steel."
- C. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- D. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."
 - 1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Truss Design."
 - 2. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."
- E. Comply with AISI's "Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two-Family Dwellings."

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

2.2 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members, unless otherwise indicated.
- B. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- C. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.
- D. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

2.3 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.
- B. Shims: Load bearing, high-density multimonomer plastic, nonleaching.

2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
 2. Flange Width: 2 inches (51 mm).
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and same minimum base-metal thickness as steel studs.
- C. Vertical Deflection Clips: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.

2.5 ROOF TRUSSES

- A. Roof Truss Members: Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched, with stiffened flanges.

2.6 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members, unless otherwise indicated.
- B. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- C. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by [hot-dip process according to ASTM A 153/A 153M, Class C.

- D. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- E. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- F. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- B. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
- C. Install framing members in one-piece lengths.
- D. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- E. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- F. Install insulation, specified in Division 07 Section "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- G. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- H. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.2 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:
 - 1. Stud Spacing: 16 inches (406 mm) of as indicated on structural drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Install single deflection tracks and anchor to building structure.
 - 2. Install double deflection tracks and anchor outer track to building structure.
 - 3. Connect vertical deflection clips to infill studs and anchor to primary building structure.
- E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
 - 1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - a. Install solid blocking at centers indicated on Shop Drawings.
 - 2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 - 3. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - 4. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable curtain-wall-framing system.

3.3 TRUSS INSTALLATION

- A. Install, bridge, and brace trusses according to Shop Drawings and requirements in this Section.
- B. Truss Spacing: 24 inches (610 mm) of as indicated on structural drawings.
- C. Do not alter, cut, or remove framing members or connections of trusses.

- D. Erect trusses with plane of truss webs plumb and parallel to each other, align, and accurately position at spacings indicated.
- E. Erect trusses without damaging framing members or connections.

3.4 SUB-FRAMING INSTALLATION

- A. Install, bridge, and brace sub-frame according to Shop Drawings and requirements in this Section.
- B. Sub-Frame Spacing: As indicated.
- C. Do not alter, cut, or remove framing members or connections of purlins.
- D. Erect sub-frame plumb and parallel to each other, align, and accurately position at spacings indicated.
- E. Erect sub-frame without damaging framing members or connections.
- F. Align load-bearing studs or continuously reinforce track to transfer loads to structure. Anchor trusses securely at all bearing points.

3.5 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 055100 - METAL STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preassembled steel stairs with concrete-filled and abrasive-coating-finished formed-metal treads.
2. Steel tube railings attached to metal stairs.
3. Steel tube handrails attached to walls adjacent to metal stairs.

B. See Division 05 Section "Pipe and Tube Railings" for pipe and tube railings not attached to metal stairs or to walls adjacent to metal stairs.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design metal stairs, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

1. Uniform Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. in. (2580 sq. mm).
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to L/240 deflection ratio or 1/4 inch (6.4 mm), whichever is less.

C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

1. Handrails and Top Rails of Guards:

- a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
- b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
- c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

- a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
- b. Infill load and other loads need not be assumed to act concurrently.

PART 2 - PRODUCTS

2.1 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Recycled Content of Steel Products: Provide products with average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
- C. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- D. Steel Tubing: ASTM A 500 (cold formed).
- E. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
- F. Steel Bars for Grating Treads: ASTM A 36/A 36M or steel strip, ASTM A 1011/A 1011M or ASTM A 1018/A 1018M.
- G. Wire Rod for Grating Crossbars: ASTM A 510 (ASTM A 510M).
- H. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
- I. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, structural steel, Grade 25 (Grade 170), unless another grade is required by design loads; exposed.
- J. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, structural steel, Grade 30 (Grade 205), unless another grade is required by design loads.

2.2 MISCELLANEOUS MATERIALS

- A. Cast-Metal Units: Cast iron, with an integral abrasive, as-cast finish.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Safety Tread Co., Inc.
 - b. Balco Inc.
 - c. Barry Pattern & Foundry Co., Inc.
 - d. Granite State Casting Co.
 - e. Safe-T-Metal Company, Inc.
 - f. Wooster Products Inc.
- B. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.

- C. Apply bituminous paint to concealed surfaces of cast-metal units set into concrete.
- D. Apply clear lacquer to concealed surfaces of extruded units set into concrete.
- E. Fasteners: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.
- F. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
- G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- H. Concrete Materials and Properties: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa) unless otherwise indicated.
- I. Welded Wire Fabric: ASTM A 185/A 185M, 6 by 6 inches (152 by 152 mm), W1.4 by W1.4, unless otherwise indicated.

2.3 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 - 1. Join components by welding unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.
 - 3. Fabricate treads and platforms of exterior stairs so finished walking surfaces slope to drain.
- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without impairing work.
- E. Weld connections to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Weld exposed corners and seams continuously unless otherwise indicated.
 - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 3 welds: partially dressed weld with spatter removed.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

- G. Fabricate joints that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.4 STEEL-FRAMED STAIRS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Alfab, Inc.
 - 2. American Stair, Inc.
 - 3. Sharon Companies Ltd. (The).
- B. Stair Framing:
 - 1. Fabricate stringers of steel plates or channels.
 - 2. Construct platforms of steel plate or channel headers and miscellaneous framing members as needed to comply with performance requirements indicated.
 - 3. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.
 - 4. Where stairs are enclosed by gypsum board shaft-wall assemblies, provide hanger rods or struts to support landings from floor construction above or below.
 - 5. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.
- C. Metal-Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements but not less than 0.067 inch (1.7 mm).
 - 1. At Contractor's option, provide stair assemblies with metal-pan subtreads filled with reinforced concrete during fabrication.
 - 2. Provide epoxy-resin-filled treads, reinforced with glass fibers, with slip-resistant, abrasive surface.
- D. Abrasive-Coating-Finished, Formed-Metal Stairs: Form risers, treads, and platforms to configurations shown from steel sheet of thickness needed to comply with performance requirements but not less than 0.097 inch (2.5 mm). Finish tread and platform surfaces with manufacturer's standard epoxy-bonded abrasive finish.
- E. Metal Floor Plate Stairs: Form treads and platforms to configurations shown from rolled-steel floor plate of thickness needed to comply with performance requirements, but not less than 1/4 inch (6.4 mm). Form treads with integral nosing and back edge stiffener. Weld steel supporting brackets to stringers and weld treads to brackets.

2.5 STAIR RAILINGS

- A. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.

1. Rails and Posts: 1-5/8-inch- (41-mm-) diameter top and bottom rails and 1-1/2-inch- (38-mm-) square posts.
 2. Picket Infill: 1/2-inch- (13-mm-) square pickets spaced less than 4 inches (100 mm) clear.
- B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 3 welds: partially dressed weld with spatter removed.
- C. Form changes in direction of railings by bending or by inserting prefabricated elbow fittings.
- D. Form curves by bending members in jigs to produce uniform curvature without buckling.
- E. Close exposed ends of railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails.
- G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.
1. Connect posts to stair framing by direct welding.
- H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, to transfer wall bracket loads through wall finishes. Size fillers to suit wall finish thicknesses.

2.6 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal stairs after assembly.
- C. Galvanizing: Hot dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
- D. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- E. Apply shop primer to uncoated surfaces of metal stair components. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- B. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
- C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints. Do not weld, cut, or abrade surfaces of exterior units that have been hot dip galvanized after fabrication.
- D. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.
- E. Place and finish concrete fill for treads and platforms to comply with Division 03 Section "Cast-in-Place Concrete."
 - 1. Install abrasive nosings with anchors fully embedded in concrete.
- F. Install precast concrete treads with adhesive supplied by manufacturer.
- G. Attach handrails to wall with wall brackets. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.

3.2 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055100

SECTION 057300 - DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum decorative railings with stainless-steel, wire-rope guard infill.

B. Related Sections:

1. Division 05 Section "Metal Stairs" for steel tube railings included with metal stairs.
2. Division 05 Section "Pipe and Tube Railings" for railings fabricated from pipe and tube components.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

- a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
- b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
- c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

- a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
- b. Infill load and other loads need not be assumed to act concurrently.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.3 SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of railings assembled from standard components.
2. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

- C. Samples: For each type of exposed finish required.
- D. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Qualification Data: For qualified professional engineer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.
- G. Preconstruction test reports.

1.4 QUALITY ASSURANCE

- A. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Aluminum Decorative Railings:
 - a. Architectural Metal Works.
 - b. Architectural Railings & Grilles, Inc.
 - c. ART Technologies, Inc.
 - d. Blum, Julius & Co., Inc.
 - e. Bluecoat of Pittsburgh.
 - f. Braun, J. G., Company; a division of the Wagner Companies.
 - g. CraneVeyor Corp.
 - h. Laurence, C. R. Co., Inc.
 - i. Livers Bronze Co.
 - j. Newman Brothers, Inc.
 - k. Pisor Industries, Inc.
 - l. Platers Polishing Company; a division of Rippel Architectural Metals.
 - m. Poma Corporation.
 - n. Sterling Dula Architectural Products, Inc.; Div. of Kane Manufacturing.
 - o. Superior Aluminum Products, Inc.
 - p. Wagner, R & B, Inc.; a division of the Wagner Companies.
 - q. Wylie Systems.

2.2 METALS, GENERAL

- A. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.3 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.
- B. Extruded Bars and Shapes, Including Extruded Tubing: ASTM B 221 (ASTM B 221M), Alloy 6063-T5/T52.
- C. Extruded Structural Pipe and Round Tubing: ASTM B 429/B 429M, Alloy 6063-T6.
- D. Drawn Seamless Tubing: ASTM B 210 (ASTM B 210M), Alloy 6063-T832.
- E. Plate and Sheet: ASTM B 209 (ASTM B 209M), Alloy 6061-T6.
- F. Die and Hand Forgings: ASTM B 247 (ASTM B 247M), Alloy 6061-T6.
- G. Castings: ASTM B 26/B 26M, Alloy A356.0-T6.

2.4 FASTENERS

- A. Fastener Materials: Unless otherwise indicated, provide the following:
 - 1. Aluminum Components: Type 304 stainless-steel fasteners.
 - 2. Stainless-Steel Components: Type 304 stainless-steel fasteners.
 - 3. Uncoated Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating where concealed; Type 304 stainless-steel fasteners where exposed.
 - 4. Galvanized-Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.
 - 5. Dissimilar Metals: Type 304 stainless-steel fasteners.
- B. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
- C. Post-Installed Anchors: Torque-controlled expansion anchors.

2.5 MISCELLANEOUS MATERIALS

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.6 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Connections: Fabricate railings with welded or nonwelded connections unless otherwise indicated.
- C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.
- D. Brazed Connections: Connect copper-alloy railings by brazing. Cope components at connections to provide close fit, or use fittings designed for this purpose. Braze corners and seams continuously.
 - 1. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and brazed surface matches contours of adjoining surfaces.
- E. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings.
- F. Form changes in direction by bending or by inserting prefabricated elbow fittings.
- G. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- H. Close exposed ends of hollow railing members with prefabricated end fittings.
- I. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
- J. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

2.7 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).

2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).
- B. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- C. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with grout.
- D. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with grout.
- E. Anchor posts to metal surfaces as indicated using fittings designed and engineered for this purpose.
- F. Anchor railing ends to concrete and masonry with brackets on underside of rails connected to railing ends and anchored to wall construction with anchors and bolts.
- G. Attach handrails to walls with wall brackets except where end flanges are used.
 1. Use type of bracket with predrilled hole for exposed bolt anchorage.
 2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- H. Secure wall brackets and railing end flanges to building construction as follows:
 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 2. For hollow masonry anchorage, use toggle bolts.
 3. For steel-framed partitions, fasten brackets directly to steel framing or concealed steel reinforcements using self-tapping screws of size and type required to support structural loads.

END OF SECTION 057300

SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Plastic-laminate cabinets.
 - 2. Plastic-laminate countertops.

1.2 SUBMITTALS

- A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1.3 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

2.2 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural woodwork, except for items specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)."
- B. Butt Hinges: 2-3/4-inch (70-mm), 5-knuckle steel hinges made from 0.095-inch- (2.4-mm-) thick metal, and as follows:
 - 1. Semi-concealed Hinges for Overlay Doors: BHMA A156.9, B01521.
- C. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.
- D. Catches: Magnetic catches, BHMA A156.9, B03141
- E. Drawer Slides: BHMA A156.9, B05091.

1. Standard Duty (Grade 1, Grade 2, and Grade 3): Side mounted; full-extension type; zinc-plated steel with polymer rollers.
- F. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
1. Satin Stainless Steel: BHMA 630.

2.3 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

2.4 FABRICATION

- A. Plastic-Laminate Cabinets: AW1 Custom Grade
1. AWI Type of Cabinet Construction: Flush overlay.
 2. Reveal Dimension: 1/2 inch (13 mm).
 3. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate as follows:
 - a. Horizontal Surfaces Other Than Tops: Grade HGS.
 - b. Vertical Surfaces: Grade HGS.
 4. Materials for Semi-Exposed Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS.
 5. Drawer Sides and Backs: Solid-hardwood lumber
 6. Drawer Bottoms: Hardwood plywood.
 7. Colors, Patterns, and Finishes: As selected by Architect from laminate manufacturer's full range of solid colors, matte finish.
- B. Plastic-Laminate Countertops: AW1 Custom Grade.
1. High-Pressure Decorative Laminate Grade: HGS.
 2. Colors, Patterns, and Finishes: As selected by Architect from laminate manufacturer's full range of solid colors, matte finish.
 3. Core Material at Sinks: exterior-grade plywood.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.

1. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c. with toggle bolts through metal backing or metal framing behind wall finish.
- B. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

END OF SECTION 064023

SECTION 071800 - TRAFFIC COATINGS

PART 1 - PRODUCTS

1.1 TRAFFIC COATING: Gallery Walking Surface.

- A. Products: Subject to compliance with requirements, provide one of the basis-of-design: Tremco, Vulkem 351.
- B. Primer: Manufacturer's standard factory-formulated primer recommended for substrate and conditions indicated.
 - 1. Material: Urethane.
- C. Preparatory and Base Coats: Single- or multicomponent, aromatic liquid urethane elastomer.
- D. Intermediate Coat: Single- or multicomponent, aromatic liquid urethane elastomer].
- E. Topcoat: Single- or multicomponent, aromatic liquid urethane elastomer with UV inhibitors.
 - 1. Color: As selected by Architect from manufacturer's full range.
- F. Component Coat Thicknesses: As recommended by manufacturer for substrate and service conditions indicated, but not less than the following (measured excluding aggregate):
 - 1. Base Coat: 25mil minimum wet film thickness.
 - 2. Topcoat: 15mil minimum wet film thickness.
- G. Aggregate: Uniformly graded, washed silica sand of particle sizes, shape, and minimum hardness recommended in writing by traffic coating manufacturer.
 - 1. Spreading Rate: As recommended by manufacturer for substrate and service conditions indicated:

PART 2 - EXECUTION

2.1 PREPARATION

- A. Clean and prepare substrates according to ASTM C 1127 and manufacturer's written recommendations to produce clean, dust-free, dry substrate for traffic coating application.
- B. Concrete Substrates: Mechanically abrade concrete surfaces to a uniform profile according to ASTM D 4259. Do not acid etch.
 - 1. Remove grease, oil, paints, and other penetrating contaminants from concrete.
 - 2. Remove concrete fins, ridges, and other projections.

3. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form-release agents, and other incompatible materials that might affect coating adhesion.
4. Remove remaining loose material to provide a sound surface, and clean surfaces according to ASTM D 4258.

2.2 JOINT AND CRACK TREATMENT

- A. Prepare, treat, rout, and fill joints and cracks in substrates according to ASTM C 1127 and manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.

2.3 TRAFFIC COATING APPLICATION

- A. Apply traffic coating material according to ASTM C 1127 and manufacturer's written recommendations.

2.4 PROTECTING AND CLEANING

END OF SECTION 071800

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass-fiber blanket insulation.
 - 2. Vapor retarders.
 - 3. Closed-Cell Polyurethane Spray Foam.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product test reports.
- C. Research/evaluation reports.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET INSULATION

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. CertainTeed Corporation.
 - 2. Guardian Building Products, Inc.
 - 3. Johns Manville.
 - 4. Knauf Insulation.
 - 5. Owens Corning.
- B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
- C. Polypropylene-Scrim-Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).
- D. Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

- E. Reinforced-Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.
- F. Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.
- G. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

2.2 VAPOR RETARDERS

- A. Polyethylene Vapor Retarders: ASTM D 4397, 6 mils (0.15 mm) thick, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.3 SPRAY FOAM

- A. Spray applied rigid cellular polyurethane thermal insulation ASTM C1029.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.2 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

- B. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 4. Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
 5. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
 6. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
 - a. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members.
 - b. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
- C. Spray-Applied Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.
- D. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
1. Loose-Fill Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.3 INSTALLATION OF VAPOR RETARDERS

- A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.
1. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches (406 mm) o.c.
 2. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings.

Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.

3. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.
- C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

END OF SECTION 072100

SECTION 075416 - ETHYLENE INTERPOLYMER (KEE) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered KEE membrane roofing system.

1.2 PERFORMANCE REQUIREMENTS

- A. Energy Performance: Provide roofing system that is listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.
- B. All roofing materials shall be Class 'A' per ASTM E 108 and shall be certified by a nationally recognized, independent testing laboratory.
- C. Roofing materials shall resist wind up-lift forces per ASCE 7-10 and design wind speeds per structural drawings.
- D. Roof membrane shall be inspected by the manufacturer's representative within one (1) year of acceptance by DSC.
- E. Contractor shall provide Architect with "Final Statement of Compliance" which states that the roof membrane complies with the approved contract documents.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
- C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 1. Submit evidence of compliance with performance requirements.
- D. Maintenance data.
- E. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product.
- F. Pre-installation Roofing Conference: Conduct conference at Project site.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 KEE MEMBRANE ROOFING

- A. KEE Sheet: ASTM D 6754, fabric reinforced, and fabric backed.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Versico; by Carlisle.
 - b. Ecology Roof Systems.
 - c. Flex Membranes International, Inc.
 - d. Seaman Corporation.
 - e. Tremco Incorporated.
 - 2. Thickness: 45 mils nominal.
 - 3. Exposed Face Color: White.

2.2 AUXILIARY MEMBRANE ROOFING MATERIALS

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as KEE sheet membrane.
- C. Bonding Adhesive: Manufacturer's standard, water based.
- D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.

- F. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.3 ROOF INSULATION

- A. Composite Polyisocyanurate Board Insulation: ASTM C 1289, with factory-applied facing board on one major surface, as indicated below by type, and felt or glass-fiber mat facer on the other.
 - 1. Type IV, cellulosic-fiber-insulating-board facer, Grade 2, 2 inch (13 mm) thick minimum.

2.4 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- B. Insulation Adhesive: Insulation manufacturer's recommended cold-applied adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- C. Cover Board: ASTM C 208, Type II, Grade 2, cellulosic-fiber insulation board, 1/2 inch (13 mm) thick.

PART 3 - EXECUTION

3.1 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
- D. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 - 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

3.2 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
- B. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.
- D. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing. All new installed materials shall be sealed against moisture intrusion at the end of the day.
- E. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- F. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
 - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.

3.3 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

END OF SECTION 075416

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured reglets and counterflashing.
2. Formed roof drainage sheet metal fabrications.
3. Formed steep-slope roof sheet metal fabrications.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.

1. Include details for forming, joining, supporting, and securing sheet metal flashing and trim, including pattern of seams, termination points, fixed points, expansion joints, expansion-joint covers, edge conditions, special conditions, and connections to adjoining work.

C. Samples: For each exposed product and for each finish specified.

D. Maintenance data.

E. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

B. Pre-installation Conference: Conduct conference at Project site.

1.4 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed; 2D (dull, cold rolled) finish.

2.2 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 40 mils (1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
 - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C).

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 - 2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

- D. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
 - 1. Obtain field measurements for accurate fit before shop fabrication.
 - 2. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.
- C. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections.

Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

- B. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Fabricate from the following materials:
 - a. Steel: 24 gauge (0.70 mm) thick.
- C. Valley Flashing: Fabricate from the following materials:
 - 1. Steel: 24 gauge (0.70 mm) thick.
- D. Drip Edges: Fabricate from the following materials:
 - 1. Steel: 24 gauge (0.70 mm) thick.
- E. Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials:
 - 1. Steel: 24 gauge (0.70 mm) thick.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement so that completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
 5. Install sealant tape where indicated.
 6. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
1. Coat back side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal joints as shown and as required for watertight construction.
- F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
 2. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored straps spaced not more than 36 inches (900 mm) apart. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m) apart. Install expansion-joint caps.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
- D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches (100 mm) in direction of water flow.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75-mm) centers.
- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with sealant.
- E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric butyl sealant and clamp flashing to pipes that penetrate roof.

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.6 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.

- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 076200

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof curbs.
 - 2. Equipment supports.
 - 3. Roof hatches.

1.2 SUBMITTALS

- A. Product Data: For each type of roof accessory indicated.
- B. Shop Drawings: For roof accessories.
- C. Samples: For each exposed product and for each color and texture specified.
- D. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items.
- E. Operation and maintenance data.
- F. Warranty: Sample of special warranty.

1.3 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.
 - 1. Mill-Phosphatized Finish: Manufacturer's standard for field painting.
 - 2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil (0.005 mm).

2.2 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Acrylic Glazing: ASTM D 4802, thermoformable, monolithic sheet, manufacturer's standard,
- C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.
- D. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.
- E. Sealants: As recommended by roof accessory manufacturer for installation indicated.

2.3 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints, stepped integral metal cant raised the thickness of roof insulation, and integrally formed deck-mounting flange at perimeter bottom.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following.
 - a. AES Industries, Inc.
 - b. Curbs Plus, Inc.
 - c. Custom Solution Roof and Metal Products.
 - d. Greenheck Fan Corporation.
 - e. LM Curbs.
 - f. Metallic Products Corp.
 - g. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
 - h. Pate Company (The).
 - i. Roof Products, Inc.
 - j. Safe Air of Illinois.
 - k. Thybar Corporation.
 - l. Vent Products Co., Inc.
- B. Material: Zinc-coated (galvanized) steel sheet, 0.052 inch (1.32 mm) thick.
 - 1. Finish: Factory prime coating.
 - 2. Color: As selected by Architect from manufacturer's full range.
- C. Construction:
 - 1. Insulation: Factory insulated with 1-1/2-inch- (38-mm-) thick glass-fiber board insulation.

2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
3. Factory-installed wood nailer at top of curb, continuous around curb perimeter.
4. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
5. Fabricate curbs to minimum height of 12 inches (300 mm) unless otherwise indicated.
6. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.
7. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
8. Security Grille: Provide where indicated.

2.4 ROOF HATCH

- A. Roof Hatches: Metal roof-hatch units with lids and insulated double-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, and integrally formed deck-mounting flange at perimeter bottom.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. AES Industries, Inc.
 - b. Babcock-Davis.
 - c. Bilco Company (The).
 - d. Bristolite Skylights.
 - e. Custom Solution Roof and Metal Products.
 - f. Dur-Red Products.
 - g. Hi Pro International, Inc.
 - h. J. L. Industries, Inc.
 - i. Metallic Products Corp.
 - j. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
 - k. Naturalite Skylight Systems; Vistawall Group (The).
 - l. Nystrom.
 - m. O'Keeffe's Inc.
 - n. Pate Company (The).
 - o. Precision Ladders, LLC.
- B. Type and Size: Single-leaf lid, 30 by 36 inches (750 by 900 mm).
- C. Loads: Minimum 40-lbf/sq. ft. (1.9-kPa) external live load and 20-lbf/sq. ft. (0.95-kPa) internal uplift load.
- D. Hatch Material: Zinc-coated (galvanized) steel sheet, 0.079 inch (2.01 mm) thick.
 1. Finish: Factory prime coating.
 2. Color: As selected by Architect from manufacturer's full range.
- E. Construction:

1. Insulation: Polyisocyanurate board.
 2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
 3. Hatch Lid: Glazed, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
 4. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
 5. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
 6. Fabricate curbs to minimum height of 12 inches (300 mm) unless otherwise indicated.
- F. Hardware: Galvanized-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
1. Provide two-point latch on lids larger than 84 inches (2130 mm).
 2. Provide remote-control operation.
- G. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.
- H. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder. Post locks in place on full extension; release mechanism returns post to closed position.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.
1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
1. Coat concealed side of roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene sheet.

- C. Seal joints with sealant as required by roof accessory manufacturer.

3.2 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Division 09 painting Sections.
- C. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.

1.2 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Warranties.

1.3 QUALITY ASSURANCE

1.4 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
 1. Architectural Sealants: 250 g/L.
 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 3. Sealant Primers for Porous Substrates: 775 g/L.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing

according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

2.2 SILICONE JOINT SEALANTS

A. Mildew-Resistant Neutral-Curing Silicone Joint Sealant: ASTM C 920.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Building Systems.
 - b. Dow Corning Corporation.
 - c. GE Advanced Materials - Silicones.
 - d. May National Associates, Inc.
 - e. Pecora Corporation.
 - f. Polymeric Systems, Inc.
 - g. Schnee-Morehead, Inc.
 - h. Sika Corporation; Construction Products Division.
 - i. Tremco Incorporated.
2. Type: Single component (S).
3. Grade: Pourable (P) or non-sag (NS).
4. Class: 100/50.
5. Uses Related to Exposure: Traffic (T) or Non-traffic (NT).

2.3 JOINT SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.4 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Non-Sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form

smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Other joints as indicated.
 2. Joint Sealant: Silicone.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal non-traffic surfaces.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints in exterior insulation and finish systems.
 - d. Perimeter joints between materials listed above and frames of doors and louvers.
 2. Joint Sealant: Silicone.
- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 2. Joint Sealant: Silicone.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces.
1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Vertical joints on exposed surfaces of interior unit masonry walls and partitions.
 - d. Perimeter joints between interior wall surfaces and frames of interior doors.
 2. Joint Sealant: Silicone.

- E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.
 - 1. Joint Sealant Location:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - 2. Joint Sealant: Silicone.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard hollow metal doors and frames.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.

1.3 QUALITY ASSURANCE

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Amweld Building Products, LLC.
 2. Benchmark; a division of Therma-Tru Corporation.
 3. Ceco Door Products; an Assa Abloy Group company.
 4. Curries Company; an Assa Abloy Group company.
 5. Deansteel Manufacturing Company, Inc.
 6. Firedoor Corporation.
 7. Fleming Door Products Ltd.; an Assa Abloy Group company.
 8. Habersham Metal Products Company.
 9. Kewanee Corporation (The).
 10. Mesker Door Inc.
 11. Pioneer Industries, Inc.
 12. Security Metal Products Corp.
 13. Steelcraft; an Ingersoll-Rand company.
 14. Windsor Republic Doors.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS, Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS, Type B.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) metallic coating.
- D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- G. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat.

2.3 STANDARD HOLLOW METAL DOORS

- A. General: Comply with ANSI/SDI A250.8.
 - 1. Design: Flush panel.
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.
 - 3. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- (1.0-mm-) thick, end closures or channels of same material as face sheets.
 - 4. Tolerances: SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. All Doors: Face sheets fabricated from metallic-coated steel sheet. Comply with ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
 - 1. Level 2 and Physical Performance Level B (Heavy Duty), Model 1 (Full Flush).
- C. Hardware Reinforcement: ANSI/SDI A250.6.

2.4 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8.

- B. All Frames: Fabricated from metallic-coated steel sheet.
 - 1. Fabricate frames with mitered or coped corners.
 - 2. Fabricate frames as face welded unless otherwise indicated.
 - 3. Frames for Level 2 Steel Doors: 0.053-inch- (1.3-mm-) thick steel sheet.
- C. Hardware Reinforcement: ANSI/SDI A250.6.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
 - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
 - 3. Floor Anchors: Formed From same materials as frames, not less than 0.042 inch (1.0 mm) thick. Monolithic Concrete Slabs: Chip-type anchors, with two holes to receive fasteners.
 - 4. Post installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

2.6 LOUVERS

- A. Provide sight proof louvers for, where indicated, that comply with SDI 111C, with blades or baffles formed of 0.020-inch- (0.5-mm-) thick, cold-rolled steel sheet set into 0.032-inch- (0.8-mm-) thick steel frame.

2.7 FABRICATION

- A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
- B. Hollow Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors. Seal joints in top edges of doors against water penetration.
- C. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 3. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - b. Post installed Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
 4. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers.
 - a. Single-Door Frames: Three door silencers.
- D. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce doors and frames to receive non-templated, mortised and surface-mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

2.8 STEEL FINISHES

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
1. Shop Primer: ANSI/SDI A250.10.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hollow Metal Frames: Comply with ANSI/SDI A250.11.
1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - b. Install frames with removable glazing stops located on secure side of opening.
 - c. Install door silencers in frames before grouting.

- d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - f. Field apply bituminous coating to backs of frames that are filled with grout containing anti-freezing agents.
 2. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 3. In-Place Concrete or Masonry Construction: Secure frames in place with post installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 4. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus, or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- B. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
 - b. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
 - c. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).

3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- C. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with hardboard.

B. Related Sections:

1. Division 08 Section "Glazing" for glass view panels in flush wood doors.

1.2 SUBMITTALS

A. Product Data: For each type of door indicated.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.
3. Indicate requirements for veneer matching.
4. Indicate doors to be factory finished and finish requirements.
5. Indicate fire-protection ratings for fire-rated doors.

1.3 QUALITY ASSURANCE

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Algoma Hardwoods, Inc.

2. Ampco, Inc.
3. Buell Door Company Inc.
4. Chappell Door Co.
5. Eagle Plywood & Door Manufacturing, Inc.
6. Eggers Industries.
7. Lambton Doors.
8. Marlite.
9. Mohawk Flush Doors, Inc.; a Masonite company.
10. VT Industries Inc.

2.2 DOOR CONSTRUCTION, GENERAL

- A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.
- B. WDMA I.S.1-A Performance Grade:
 1. Heavy Duty unless otherwise indicated.
- C. Particleboard-Core Doors:
 1. Particleboard: ANSI A208.1, Grade LD-1, made with binder containing no urea-formaldehyde resin.
 2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
- D. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
 1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.

2.3 VENEERED-FACED DOORS FOR TRANSPARENT FINISH

- A. Interior Solid-Core Doors:
 1. Grade: Custom (Grade A faces).
 2. Species: White oak.
 3. Cut: Plain sliced (flat sliced).
 4. Match between Veneer Leaves: Pleasing match.
 5. Assembly of Veneer Leaves on Door Faces: Running match.
 6. Core: Particleboard.
 7. Construction: Five or seven plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering.
 8. Construction: Seven plies, either bonded or nonbonded construction.

2.4 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 - 1. Comply with requirements in NFPA 80 for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied.
- C. Openings: Cut and trim openings through doors in factory.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hardware: For installation, see Division 08 Section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
 - a. Comply with NFPA 80 for fire-rated doors.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION 081416

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Service doors.
2. Counter doors.

B. Related Section:

1. Division 05 Section "Metal Fabrications" for miscellaneous steel supports.

1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance, Exterior Doors: Exterior overhead coiling doors shall withstand the wind loads, the effects of gravity loads, and loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.

1. Wind Loads: As indicated on Drawings.

B. Windborne-Debris-Impact-Resistance Performance: Provide impact-protective overhead coiling doors that pass missile-impact and cyclic-pressure tests when tested according to ASTM E 1886 and ASTM E 1996.

1. Large Missile Test: For overhead coiling doors located within 30 feet (9.144 m) of grade.

1.3 SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Show locations of replaceable fusible links.

C. Maintenance Data.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

PART 2 - PRODUCTS

2.1 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated.
- B. Bottom Bar for Service Doors: Consisting of two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch (38 by 38 by 3 mm) thick; fabricated from metal to match curtain slats and finish.
- C. Bottom Bar for Counter Doors: Manufacturer's standard continuous channel or tubular shape, fabricated from metal to match curtain slats and finish.
- D. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.2 HOOD

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
 - 1. Include automatic drop baffle on fire-rated doors to guard against passage of smoke or flame.

2.3 COUNTER DOORS

- A. Integral Frame, Hood, and Fascia for Counter Door: Welded sheet metal assembly of the following sheet metal: Galvanized Steel.
- B. Integral Metal Sill for Counter Door: Fabricate sills as integral part of frame assembly of Type 304 stainless steel in manufacturer's standard thickness with No. 4 finish.

2.4 LOCKING DEVICES

- A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

2.5 CURTAIN ACCESSORIES

- A. Weatherseals: Equip each exterior door with weather-stripping gaskets fitted to entire perimeter of door for a weathertight installation, unless otherwise indicated.
- B. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door. Provide pull-down straps or pole hooks for doors more than 84 inches (2130 mm) high.

2.6 MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.7 MANUAL DOOR OPERATORS

- A. Equip door with manufacturer's recommended manual door operator unless another type of door operator is indicated.
- B. Push-up Door Operation: Design counterbalance mechanism so required lift or pull for door operation does not exceed 25 lbf (111 N).
- C. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum 25 lbf (111 N) force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.

2.8 DOOR ASSEMBLY

- A. Service Door: Overhead coiling door formed with curtain of interlocking metal slats.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ACME Rolling Doors.
 - b. Alpine Overhead Doors, Inc.
 - c. AlumaTek, Inc.
 - d. C.H.I. Overhead Doors.

- e. City-Gates.
 - f. Cookson Company.
 - g. Cornell Iron Works, Inc.
 - h. Dynamic Closures Corp.
 - i. Lawrence Roll-Up Doors, Inc.
 - j. Mahon Door Corporation.
 - k. McKeon Rolling Steel Door Company, Inc.
 - l. Metro Door.
 - m. Overhead Door Corporation.
 - n. QMI Security Solutions.
 - o. Raynor.
 - p. Southwestern Steel Rolling Door Co.
 - q. Wayne-Dalton Corp.
 - r. Windsor Door.
- B. Operation Cycles: Not less than 10,000.
- C. Door Curtain Material: Galvanized steel.
- D. Door Curtain Slats: Flat profile slats of 1-1/4-inch (32-mm) center-to-center height.
- E. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats.
- F. Hood: Match curtain material and finish.
- 1. Shape: Square.
 - 2. Mounting: Face of wall.
- G. Sill Configuration for Counter Door: No sill.
- H. Locking Devices: Equip door with slide bolt for padlock.
- I. Manual Door Operator: Push-up operation.
- 1. Provide operator with manufacturer's standard removable operating arm.
- J. Door Finish:
- 1. Factory Prime Finish: Manufacturer's standard color.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

- B. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion. Lubricate bearings and sliding parts as recommended by manufacturer. Adjust seals to provide weathertight fit around entire perimeter.

3.2 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 083323

SECTION 083513 - FOLDING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Accordion folding doors.
2. Bifold doors.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, attachments to other work.
- C. Samples: For each exposed product and for each color and texture specified.
- D. Product Schedule: For folding doors. Use same designations indicated on Drawings.
- E. Product certificates.
- F. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 50 or less.

PART 2 - PRODUCTS

2.1 ACCORDION FOLDING DOORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Curtition, Inc.
 2. FolDoor; Holcomb & Hoke Mfg. Co., Inc.
 3. Hufcor, Inc.
 4. KWIK-WALL Company.

5. Moderco Inc.
 6. Modernfold, Inc; a DORMA Group company.
 7. Panelfold Inc.
- B. General: Top-supported, horizontal-sliding, manually operated accordion folding doors, with chain controlling the spacing and extension of pantographic or X-type accordion folding frames. Inner and outer covers are continuous surface facings that attach to and completely cover the folding frames and are pleated as the door is retracted.
- C. Outer Covering: Complying with indicated surface-burning characteristics; attached to door support frames in a concealed manner at sufficient intervals to prevent sagging and separation and to permit on-site removal and repair, with vertical seams located in valleys and material hemmed at top and bottom.
1. Vinyl reinforced with woven backing weighing not less than 20 oz./linear yd. (567 g/m).
 - a. Color, Texture, and Pattern: As selected by Architect from manufacturer's full range.
- D. Sweep Seals: Manufacturer's standard top and bottom sweep seals on both sides.
- E. Carriers: Four-wheel carriers at lead post and two-wheel carriers at intermediate spacing, as necessary for size and weight of partition, to ensure secure, easy, and quiet operation.
1. Doors 96 Inches (2438 mm) High or Less: Nylon wheels on steel shafts.
 2. Doors More Than 96 Inches (2438 mm) High: Ball-bearing wheels with nylon tread and steel shafts.
- F. Tracks: Manufacturer's standard metal track made of extruded aluminum or formed steel with factory-applied, corrosion-resistant finish. Limit track deflection, independent of structural supporting system, to no more than 80 percent of bottom clearance.
1. Head Trim: Prefinished wood molding for surface-mounted tracks.
 2. Center stop for center-opening partitions.
 3. Galvanized-steel sheet or aluminum subchannel for forming pocket for recessed suspension track.
 4. Metal ceiling contact guard to protect finished ceiling surface from damage by moving top sweep seals; with finish matching other exposed metal.
 5. Curved track sections with ceiling clips to accommodate configuration indicated.
 6. Glide switch to divert door to auxiliary track.
 7. Pivot switch to change track direction.
 8. Cross-track switch to allow one door to cross another.
- G. Hardware: Manufacturer's standard heavy-duty, manually operated metal pulls and latches as follows:
1. Finish: Clear-anodized aluminum.
 2. Latch: Operable from both sides of closed door with coin-slot release on opposite side.
 3. Lock: Manufacturer's standard key-operated cylinder lock, operable from both sides.

- H. Jamb Molding: Manufacturer's standard wood or metal molding at closing jamb as required for light-tight jamb closure.
- I. Lead Posts and Jamb Posts: Not less than 0.048-inch- (1.2-mm-) thick extruded aluminum, formed for rigidity and light seal at supporting construction.
 - 1. Nonferrous jamb strip for single-operating partitions to ensure tight closure by engaging rubber bumper on lead post.
- J. Meeting Post: Fixed single jamb for single-stacked doors.
- K. Stacking: Tiebacks to maintain door in stacked position.
- L. Stacking Configuration: Stack single doors at one end of opening.
- M. Opening Size: As indicated on Drawings.

2.2 BIFOLD DOORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Dunbarton Corporation; Slimfold Products Division.
- B. General: Metal folding doors hinged together in pairs and supported on pivots at jamb, with floor and overhead track and door guide pins.
- C. Metal Panels: Sizes as indicated, formed from nominal 0.024-inch- (0.6-mm-) thick, cold-rolled steel sheet. Channel form vertical edges and weld cross bracing to panel and channel-formed edges.
 - 1. Surface Profile: Flush.
 - 2. Configuration: Two-panel bifold.
 - 3. Sheet Metal Texture: Smooth.
 - 4. Protective Finish: Hot-dip galvanized coating applied to panels, stiffeners, hinges, and decorative trim.
 - 5. Baked Finish: Baked-enamel factory finish in white.
- D. Hardware: Manufacturer's standard felt pads, screws, and pulls in standard finish. Hinges, pivots, and manufacturer's standard wheels factory installed and as follows:
 - 1. Hinges: 3 self-aligning hinges.
 - 2. Guides and Pivots: Not less than 5/16-inch- (7.9-mm-) diameter, adjustable screw-type, weight-bearing, zinc-plated pivot rod held in place by nylon rod clamp assemblies; with not less than 1/4-inch- (6.4-mm-) diameter, spring-loaded, self-aligning, zinc-plated steel guide rods and top pivot rods held in place by nylon sleeves.
 - 3. Track: Prefinished rolled steel with baked-enamel paint finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install folding doors complying with manufacturer's written installation instructions. Install track in one piece.
- B. Standard Floor Clearances: 1/4 to 3/4 inch (6.4 to 19 mm) maximum (above floor finish).
- C. Adjust units as necessary to ensure smooth, quiet operation without warping or binding. Adjust hardware to function smoothly. Confirm that latches engage accurately and securely without forcing or binding.

END OF SECTION 083513

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior storefront framing.
2. Storefront framing for punched openings.
3. Exterior manual-swing entrance doors and door frame units.

1.2 PERFORMANCE REQUIREMENTS

A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:

1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
2. Dimensional tolerances of building frame and other adjacent construction.
3. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferring to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
 - d. Noise or vibration created by wind and by thermal and structural movements.
 - e. Loosening or weakening of fasteners, attachments, and other components.
 - f. Failure of operating units.

B. Deflection of Framing Members:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane shall not exceed $L/175$ of the glass edge length for each individual glazing lite $1/175$ of clear span for spans up to 13 feet 6 inches (4.1 m) and to $1/240$ of clear span plus $1/4$ inch (6.35 mm) for spans greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to $3/4$ inch (19 mm), whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to $L/360$ of clear span or $1/8$ inch (3.2 mm), whichever is smaller amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components directly below them to less than $1/8$ inch (3.2 mm) and clearance between members and operable units directly below them to less than $1/16$ inch (1.5 mm).

- C. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa).
- D. Water Penetration under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.
- C. Samples: For each type of exposed finish required.
- D. Other Action Submittals:
 - 1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.
- E. Maintenance data.
- F. Warranties: Sample of special warranties.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
- C. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and Florida Building Code.
- D. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.

- E. Preinstallation Conference: Conduct conference at Project site.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes do not comply with requirements or that fail in materials or workmanship within specified warranty period. Warranty does not include normal weathering.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Arcadia, Inc.
 - 2. Arch Aluminum & Glass Co., Inc.
 - 3. CMI Architectural.
 - 4. Commercial Architectural Products, Inc.
 - 5. EFCO Corporation.
 - 6. Kawneer North America; an Alcoa company.
 - 7. Leed Himmel Industries, Inc.
 - 8. Pittco Architectural Metals, Inc.
 - 9. TRACO.
 - 10. Tubelite.
 - 11. United States Aluminum.
 - 12. Vistawall Architectural Products; The Vistawall Group; a Bluescope Steel company.
 - 13. YKK AP America Inc.

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 - 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 - 3. Extruded Structural Pipe and Tubes: ASTM B 429.
 - 4. Structural Profiles: ASTM B 308/B 308M.
 - 5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

- B. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer, complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
 - 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - 2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 - 3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.3 FRAMING SYSTEMS

- A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - 1. Construction: Nonthermal.
 - 2. Glazing System: Retained mechanically with gaskets on four sides.
 - 3. Glazing Plane: Center.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts, complying with ASTM A 123/A 123M or ASTM A 153/A 153M.
- E. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.

2.4 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
 - 1. Door Construction: 1-3/4-inch (44.5-mm) overall thickness, with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
 - 2. Door Design: Medium stile; 3-1/2-inch (88.9-mm) nominal width.
 - a. Accessible Doors: Smooth surfaced for width of door in area within 10 inches (255 mm) above floor or ground plane.

3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.

- a. Provide nonremovable glazing stops on outside of door.

- B. Entrance Door Hardware: As specified in Division 08 Section "Door Hardware."

2.5 ENTRANCE DOOR HARDWARE

- A. General: Provide entrance door hardware for each entrance door to comply with requirements in this Section.

1. Opening-Force Requirements:

- a. Egress Doors: Not more than 15 lbf (67 N) to release the latch and not more than 30 lbf (133 N) to set the door in motion and not more than 15 lbf (67 N) to open the door to its minimum required width.
 - b. Accessible Interior Doors: Not more than 5 lbf (22.2 N) to fully open door.

- B. Opening-Force Requirements:

1. Latches and Exit Devices: Not more than 15 lbf (67 N) required to release latch.

- C. Pivot Hinges: BHMA A156.4, Grade 1.

1. Offset-Pivot Hinges: Provide top, bottom, and intermediate offset pivots at each door leaf.

- D. Automatic and Self-Latching Flush Bolts: BHMA A156.3, Grade 1.

- E. Cylinders: As specified in Division 08 Section "Door Hardware."

- F. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.

- G. Operating Trim: BHMA A156.6.

- H. Closers: BHMA A156.4, Grade 1, with accessories required for a complete installation, sized as required by door size, exposure to weather, and anticipated frequency of use; adjustable to meet field conditions and requirements for opening force.

- I. Door Stops: BHMA A156.16, Grade 1, floor or wall mounted, as appropriate for door location indicated, with integral rubber bumper.

- J. Weather Stripping: Manufacturer's standard replaceable components.

- K. Thresholds: BHMA A156.21, raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch (13 mm).

2.6 ACCESSORY MATERIALS

- A. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil (0.762-mm) thickness per coat.

2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 6. Provisions for field replacement of glazing from interior.
 - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, or thicker.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
6. Seal joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

D. Set continuous sill members and flashing in full sealant bed as specified in Division 07 Section "Joint Sealants" to produce weathertight installation.

E. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

F. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.2 FIELD QUALITY CONTROL

A. Repair or remove work if test results and inspections indicate that it does not comply with specified requirements.

B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Aluminum-framed assemblies will be considered defective if they do not pass tests and inspections.

- D. Prepare test and inspection reports.

END OF SECTION 084113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Commercial door hardware.
 - 2. Cylinders for doors specified in other Sections.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Details of electrified door hardware, including wiring diagrams.
- C. Other Action Submittals:
 - 1. Door Hardware Sets: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as procedures and diagrams.
 - a. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
 - b. Content: Include the following information:
 - 1) Identification number, location, hand, fire rating, and material of each door and frame.
 - 2) Type, style, function, size, quantity, and finish of each door hardware item. Include description and function of each lockset and exit device.
 - 3) Complete designations of every item required for each door or opening including name and manufacturer.
 - 4) Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by lock manufacturer.
 - 1. Installer's responsibilities include supplying and installing door hardware and providing a qualified Architectural Hardware Consultant available during the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

- B. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.5 COORDINATION

- A. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Three years from date of Substantial Completion, except as follows:
 - a. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in this Section and door hardware sets indicated in door and frame schedule.
 - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Sets" Article. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Sets" Article.
 - 2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

2.2 HINGES, GENERAL

- A. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- B. Hinge Base Metal: Unless otherwise indicated, provide the following:
 - 1. Exterior Hinges: Stainless steel, with stainless-steel pin.

- C. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for outswinging exterior doors.
- D. Fasteners: Comply with the following:
 - 1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.

2.3 HINGES

- A. Butts and Hinges: BHMA A156.1.
- B. Template Hinge Dimensions: BHMA A156.7.
- C. Available Manufacturers:
 - 1. Baldwin Hardware Corporation (BH).
 - 2. Bommer Industries, Inc. (BI).
 - 3. Cal-Royal Products, Inc. (CRP).
 - 4. Hager Companies (HAG).
 - 5. Lawrence Brothers, Inc. (LB).
 - 6. McKinney Products Company; an ASSA ABLOY Group company (MCK).
 - 7. PBB, Inc. (PBB).
 - 8. Stanley Commercial Hardware; Div. of The Stanley Works (STH).

2.4 LOCKS AND LATCHES, GENERAL

- A. Accessibility Requirements: Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22 N).
- B. Lock Trim:
 - 1. Levers: Schlage ND Tubular or similar.
 - 2. Dummy Trim: Match lever lock trim and escutcheons.
- C. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors.
- D. Backset: 2-3/4 inches (70 mm), unless otherwise indicated.
- E. Strikes: Manufacturer's standard strike with strike box for each latch bolt or lock bolt, with curved lip extended to protect frame, finished to match door hardware set.

2.5 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: Function numbers and descriptions indicated in door hardware sets comply with the following:
 - 1. Bored Locks: BHMA A156.2.

B. Bored Locks: BHMA A156.2, Grade 1; Series 4000.

1. Available Manufacturers:

- a. Arrow USA; an ASSA ABLOY Group company (ARW).
- b. Best Access Systems; Div. of The Stanley Works (BAS).
- c. Cal-Royal Products, Inc. (CRP).
- d. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (CR).
- e. Falcon Lock; an Ingersoll-Rand Company (FAL).
- f. Marks USA (MKS).
- g. Medeco Security Locks, Inc.; an ASSA ABLOY Group company (MED).
- h. PDQ Manufacturing (PDQ).
- i. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SGT).
- j. Schlage Commercial Lock Division; an Ingersoll-Rand Company (SCH).
- k. Security Door Controls (SDC).
- l. Weiser Lock; a Masco Company (WEI).
- m. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

2.6 AUXILIARY LOCKS AND LATCHES

A. Auxiliary Locks: BHMA A156.5, Grade 1.

1. Available Manufacturers:

- a. ABLOY Security, Inc.; an ASSA ABLOY Group company (ABL).
- b. Accurate Lock & Hardware Co. (ALH).
- c. Adams Rite Manufacturing Co. (ARM).
- d. Arrow USA; an ASSA ABLOY Group company (ARW).
- e. Best Access Systems; Div. of The Stanley Works (BAS).
- f. Cal-Royal Products, Inc. (CRP).
- g. Falcon Lock; an Ingersoll-Rand Company (FAL).
- h. Marks USA (MKS).
- i. Medeco Security Locks, Inc.; an ASSA ABLOY Group company (MED).
- j. PDQ Manufacturing (PDQ).
- k. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SGT).
- l. Schlage Commercial Lock Division; an Ingersoll-Rand Company (SCH).
- m. Weiser Lock; a Masco Company (WEI).
- n. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

2.7 DOOR BOLTS

A. Bolt Throw: Comply with testing requirements for length of bolts required for labeled fire doors.

B. Dustproof Strikes: BHMA A156.16, Grade 1.

2.8 LOCK CYLINDERS

- A. Standard Lock Cylinders: BHMA A156.5, Grade 1.
- B. Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
 - 1. Number of Pins: Five.
- C. Permanent Cores: Manufacturer's standard; finish face to match lockset; with interchangeable cores.
- D. Construction Keying: Comply with the following:
 - 1. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.
 - 2. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.
 - a. Furnish permanent cores to Owner for installation.
- E. Manufacturer: Same manufacturer as for locks and latches.

2.9 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference into master key system.

2.10 OPERATING TRIM

- A. Standard: BHMA A156.6.
- B. Materials: Fabricate from stainless steel, unless otherwise indicated.
- C. Available Manufacturers:
 - 1. Burns Manufacturing Incorporated (BM).
 - 2. Forms + Surfaces (FS).
 - 3. Hager Companies (HAG).
 - 4. Hiawatha, Inc. (HIA).
 - 5. IVES Hardware; an Ingersoll-Rand Company (IVS).
 - 6. Rockwood Manufacturing Company (RM).
 - 7. Trimco (TBM).

2.11 CLOSERS

- A. Accessibility Requirements: Comply with the following maximum opening-force requirements:
 - 1. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.

- B. Door Closers for Means of Egress Doors: Comply with NFPA 101. Door closers shall not require more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.
- C. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
- D. Surface Closers: BHMA A156.4, Grade 1. Provide type of arm required for closer to be located on non-public side of door, unless otherwise indicated.
 - 1. Available Manufacturers:
 - a. Arrow USA; an ASSA ABLOY Group company (ARW).
 - b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (CR).
 - c. DORMA Architectural Hardware; Member of The DORMA Group North America (DAH).
 - d. Dor-O-Matic; an Ingersoll-Rand Company (DOR).
 - e. LCN Closers; an Ingersoll-Rand Company (LCN).
 - f. Norton Door Controls; an ASSA ABLOY Group company (NDC).
 - g. Rixson Specialty Door Controls; an ASSA ABLOY Group company (RIX).
 - h. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SGT).
 - i. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

2.12 PROTECTIVE TRIM UNITS

- A. Size: 1-1/2 inches (38 mm) less than door width on push side and 1/2 inch (13 mm) less than door width on pull side, by height specified in door hardware sets.
- B. Metal Protective Trim Units: BHMA A156.6; beveled top and 2 sides; fabricated from the following material:
 - 1. Material: 0.050-inch- (1.3-mm-) thick stainless steel.
 - 2. Available Manufacturers:
 - a. American Floor Products Co., Inc. (AFP).
 - b. Baldwin Hardware Corporation (BH).
 - c. Burns Manufacturing Incorporated (BM).
 - d. Don-Jo Mfg., Inc. (DJO).
 - e. Hager Companies (HAG).
 - f. Hiawatha, Inc. (HIA).
 - g. IPC Door and Wall Protection Systems, Inc.; Div. of InPro Corporation (IPC).
 - h. IVES Hardware; an Ingersoll-Rand Company (IVS).
 - i. Pawling Corporation (PAW).
 - j. Rockwood Manufacturing Company (RM).
 - k. Trimco (TBM).

2.13 STOPS AND HOLDERS

- A. Stops and Bumpers: BHMA A156.16, Grade 1.
 - 1. Provide floor stops for doors unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic. Where floor or wall stops are not appropriate, provide overhead holders.
- B. Combination Floor and Wall Stops and Holders: BHMA A156.8, Grade 1.
- C. Silencers for Door Frames: BHMA A156.16, Grade 1; neoprene or rubber; fabricated for drilled-in application to frame.

2.14 DOOR GASKETING

- A. Standard: BHMA A156.22.
- B. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
 - 1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- C. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- D. Gasketing Materials: ASTM D 2000 and AAMA 701/702.

2.15 THRESHOLDS

- A. Standard: BHMA A156.21.
- B. Accessibility Requirements: Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
- C. Thresholds for Means of Egress Doors: Comply with NFPA 101. Maximum 1/2 inch (13 mm) high.

2.16 FABRICATION

- A. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.
- B. Fasteners: Provide screws according to commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

- C. Finishes: BHMA A156.18, as indicated in door hardware sets.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Steel Doors and Frames: Comply with DHI A115 Series. Drill and tap doors and frames for surface-applied door hardware according to ANSI A250.6.
- B. Mounting Heights: Mount door hardware units at heights indicated as follows unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- C. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- E. Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 - 2. Door Closers: Unless otherwise required by authorities having jurisdiction, adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Windows.
 - 2. Doors.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 by a qualified professional engineer, using the following design criteria:
 - 1. Design Wind Pressures: As required by Code.
 - 2. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.

1.3 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
 - 1. Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.4 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Preconstruction adhesion and compatibility test report.

1.5 QUALITY ASSURANCE

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA's "Laminated Glazing Reference Manual."
- B. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

1.6 WARRANTY

- A. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

- A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
- B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.
- C. Windborne-Debris-Impact Resistance: Provide exterior glazing that passes basic protection testing requirements in ASTM E 1996 for Wind Zone 1 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on the Project and shall be installed in same manner as glazing indicated for use on the Project.
 - 1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.

- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
 2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.2 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (tinted) unless otherwise indicated.
1. Products: Subject to compliance with requirements, provide available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. AFG Industries, Inc.; Krystal Klear.
 - b. Guardian Industries Corp.; Ultrawhite.
 - c. Pilkington North America; Optiwhite.
 - d. PPG Industries, Inc.; Starphire.
- B. Reflective-Coated Vision Glass: ASTM C 1376, coated by pyrolytic process and complying with other requirements specified.
1. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
 - a. Pilkington North America PPG Industries Inc, Guardian Glass.
 2. Kind: Kind CV (coated vision glass), except that Kind CO (coated overhead glass) may be used where the lower edge of the glass is more than 6 feet (1.8 m) above the adjacent floor level or cannot be approached closer than 10 feet (3.0 m).
 3. Coating Color: Pewter.
 4. Glass: Tinted float.
 5. Tint Color: Gray.
 6. Visible Light Transmittance: 60 percent minimum.

2.3 LAMINATED GLASS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Cardinal Glass Industries
 2. Viracon
 3. Pilkington North America.

- B. Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
1. Construction: Laminate glass with polyvinyl butyral interlayer or cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written recommendations.
 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 3. Interlayer Color: Clear unless otherwise indicated.
- C. Windborne-Debris-Impact-Resistant Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, with "Windborne-Debris-Impact Resistance" Paragraph in "Glass Products, General" Article, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
1. Construction: Laminate glass with one of the following to comply with interlayer manufacturer's written recommendations:
 - a. Polyvinyl butyral interlayer.
 - b. Polyvinyl butyral interlayers reinforced with polyethylene terephthalate film.
 - c. Ionoplast interlayer.
 - d. Cast-in-place and cured-transparent-resin interlayer.
 - e. Cast-in-place and cured-transparent-resin interlayer reinforced with polyethylene terephthalate film.
 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 3. Interlayer Color: Clear unless otherwise indicated.

2.4 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
1. Neoprene complying with ASTM C 864.
 2. EPDM complying with ASTM C 864.
 3. Silicone complying with ASTM C 1115.
 4. Thermoplastic polyolefin rubber complying with ASTM C 1115.
- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene EPDM silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.
1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

- C. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; non-staining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- D. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
 - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.5 MISCELLANEOUS GLAZING MATERIALS

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- F. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

- B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Apply heel bead of elastomeric sealant.
- F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.4 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.5 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION 088000

SECTION 088300 - MIRRORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the following types of silvered flat glass mirrors:

1. Annealed monolithic glass mirrors.
2. Tempered glass mirrors qualifying as safety glazing.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachments to other work.
- C. Samples:
1. Mirrors: 12 inches (300 mm) square, including edge treatment on two adjoining edges.
 2. Mirror Clips: Full size.
 3. Mirror Trim: 12 inches (300 mm) long.
- D. Preconstruction test reports.
- E. Maintenance data.
- F. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

- A. Glazing Publications: Comply with GANA's "Glazing Manual" and "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."
- B. Safety Glazing Products: For tempered mirrors, provide products complying with testing requirements in 16 CFR 1201 for Category II materials.
- C. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing and substrates on which mirrors are installed.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which mirror manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as

defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SILVERED FLAT GLASS MIRRORS

- A. Glass Mirrors, General: ASTM C 1503; manufactured using copper-free, low-lead mirror coating process.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Arch Aluminum & Glass Co., Inc.
- b. Avalon Glass and Mirror Company.
- c. Binswanger Mirror; a division of Vitro America, Inc.
- d. D & W Incorporated
- e. Donisi Mirror Company.
- f. Gardner Glass, Inc.
- g. Gilded Mirrors, Inc.
- h. Guardian Industries.
- i. Head West.
- j. Independent Mirror Industries, Inc.
- k. Lenoir Mirror Company.
- l. Maran-Wurzell Glass & Mirror.
- m. National Glass Industries.
- n. Stroupe Mirror Co., Inc.
- o. Sunshine Mirror; Westshore Glass Corp.
- p. Virginia Mirror Company, Inc.
- q. Walker Glass Co., Ltd.

- B. Tempered Clear Glass: Mirror Glazing Quality, for blemish requirements; and comply with ASTM C 1048 for Kind FT, Condition A, tempered float glass before silver coating is applied.

1. Nominal Thickness: 5.0 mm.

2.2 MISCELLANEOUS MATERIALS

- A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- B. Edge Sealer: Approved by mirror manufacturer.

- C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors.
- D. Film Backing for Safety Mirrors: Film backing and pressure-sensitive adhesive; both compatible with mirror backing paint as certified by mirror manufacturer.

2.3 MIRROR HARDWARE

- A. Top and Bottom Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover bottom and top edges of each mirror in a single piece.
 - 1. Finish: Clear bright anodized.
- B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.
- C. Anchors and Inserts: Provide devices as required for mirror hardware installation.

2.4 FABRICATION

- A. Cutouts: Fabricate cutouts before tempering for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.
- B. Mirror Edge Treatment: Flat polished. Seal edges of mirrors with edge sealer.
- C. Film-Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint as recommended in writing by film-backing manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.
 - 1. Verify compatibility with and suitability of substrates, including compatibility of mirror mastic with existing finishes or primers.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.
- B. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

- C. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
- D. Wall-Mounted Mirrors: Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
- E. Protect mirrors from breakage and contaminating substances resulting from construction operations.
- F. Do not permit edges of mirrors to be exposed to standing water.
- G. Maintain environmental conditions that will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.
- H. Wash exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash mirrors as recommended in writing by mirror manufacturer.

END OF SECTION 088300

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes non-load-bearing steel framing members for the following applications:
 - 1. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

PART 2 - PRODUCTS

2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
 - 2. Protective Coating: ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating, unless otherwise indicated.

2.2 STEEL FRAMING FOR FRAMED ASSEMBLIES

- A. Steel Studs and Runners: ASTM C 645.
 - 1. Minimum Base-Metal Thickness: 24 ga.
- B. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: 24 ga.
- C. Cold-Rolled Channel Bridging: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.

1. Depth: 1-1/2 inches (38.1 mm).
 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38.1 by 38.1 mm), 0.068-inch- (1.73-mm-) thick, galvanized steel.
- D. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base Metal Thickness: 0.0312 inch (0.79 mm).
 2. Depth: 1-1/2 inches (38.1 mm).
- E. Resilient Furring Channels: 1/2-inch- (12.7-mm-) deep, steel sheet members designed to reduce sound transmission.
1. Configuration: Asymmetrical or hat shaped.
- F. Cold-Rolled Furring Channels: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.
1. Depth: 3/4 inch (19.1 mm).
 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare-steel thickness of 0.0312 inch (0.79 mm).
 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.
- G. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (31.8 mm), wall attachment flange of 7/8 inch (22.2 mm), minimum bare-metal thickness of 0.0179 inch (0.45 mm), and depth required to fit insulation thickness indicated.

2.3 AUXILIARY MATERIALS

- A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

3.2 INSTALLING FRAMED ASSEMBLIES

- A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- B. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to

terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb, unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (12.7-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
3. Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

C. Z-Furring Members:

1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches (610 mm) o.c.
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (600 mm) o.c.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (300 mm) from corner and cut insulation to fit.

- D. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 092400 - PORTLAND CEMENT PLASTERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior portland cement plasterwork (stucco) on metal lath and .

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.
- C. Samples: For each type of factory-prepared finish coat indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Where indicated, provide portland cement plaster assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Sound-Transmission Characteristics: Where indicated, provide portland cement plaster assemblies identical to those of assemblies tested for STC ratings per ASTM E 90 and classified according to ASTM E 413 by a qualified testing agency.
- C. Mockups: Before plastering, install mockups of at least 100 sq. ft. (9.3 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 PROJECT CONDITIONS

- A. Comply with ASTM C 926 requirements.

PART 2 - PRODUCTS

2.1 METAL LATH

- A. Expanded-Metal Lath: ASTM C 847 with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
 - 1. Diamond-Mesh Lath: Self-furring, 2.5 lb/sq. yd. (1.4 kg/sq. m).
- B. Paper Backing: FS UU-B-790, Type I, Grade B, Style 1a vapor-retardant paper.
 - 1. Provide paper-backed lath in locations indicated on Drawings.

2.2 ACCESSORIES

- A. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Metal Accessories:
 - 1. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G60 (Z180) zinc coating.
 - 2. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
 - 3. External-Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
 - 4. Cornerbeads: Fabricated from zinc.
 - a. Small-nose style; use unless otherwise indicated.
 - 5. Casing Beads: Fabricated from zinc; square-edged style; with expanded flanges.
 - 6. Control Joints: Fabricated from zinc; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
 - 7. Expansion Joints: Fabricated from zinc; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
 - 8. Two-Piece Expansion Joints: Fabricated from zinc; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch (6.34 to 16 mm) wide; with perforated flanges.

2.3 MISCELLANEOUS MATERIALS

- A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in portland cement plaster.
- C. Bonding Compound: ASTM C 932.

- D. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.
- E. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.

2.4 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
 - 1. Color for Finish Coats: Gray.
- B. Masonry Cement: ASTM C 91, Type N.
 - 1. Color for Finish Coats: Gray.
- C. Plastic Cement: ASTM C 1328.
- D. Colorants for Job-Mixed Finish Coats: Colorfast mineral pigments that produce finish plaster color.
- E. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.
- F. Sand Aggregate: ASTM C 897.
 - 1. Color for Job-Mixed Finish Coats: White.
- G. Perlite Aggregate: ASTM C 35.
- H. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, coloring agents, and proprietary ingredients.
 - 1. Color: As selected by Architect from manufacturer's full range.
- I. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems, formulated with colorfast mineral pigments and fine aggregates; for use over portland cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.
 - 1. Color: As selected by Architect from manufacturer's full range.

2.5 PLASTER MIXES

- A. General: Comply with ASTM C 926 for applications indicated.
- B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:
 - 1. Portland Cement Mixes:

- a. Scratch Coat: For cementitious material, mix 1-part portland cement and 0 to 3/4 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - b. Brown Coat: For cementitious material, mix 1-part portland cement and 0 to 3/4 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.
- C. Job-Mixed Finish-Coat Mixes:
- 1. Portland Cement Mix: For cementitious materials, mix 1-part portland cement and 3/4 to 1-1/2 parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
 - 2. Masonry Cement Mix: 1-part masonry cement and 1-1/2 to 3 parts aggregate.
 - 3. Portland and Masonry Cement Mix: For cementitious materials, mix 1-part portland cement and 1-part masonry cement. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
 - 4. Plastic Cement Mix: 1-part plastic cement and 1-1/2 to 3 parts aggregate.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Prepare solid substrates for plaster that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

3.2 INSTALLATION, GENERAL

- A. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.
- B. Sound Attenuation Blankets: Where required, install blankets before installing lath unless blankets are readily installed after lath has been installed on one side.
- C. Acoustical Sealant: Where required, seal joints between edges of plasterwork and abutting construction with acoustical sealant.

3.3 INSTALLING METAL LATH

- A. Expanded-Metal Lath: Install according to ASTM C 1063.
 - 1. On Solid Surfaces, Not Otherwise Furred: Install self-furring, diamond-mesh lath.

3.4 INSTALLING ACCESSORIES

- A. Install according to ASTM C 1063 and at locations indicated on Drawings.

B. Reinforcement for External Corners:

1. Install lath-type, external-corner reinforcement at exterior locations.
2. Install cornerbead at exterior locations.

C. Control Joints: Install control joints at locations indicated on Drawings.

1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
 - a. Vertical Surfaces: 144 sq. ft. (13.4 sq. m).
 - b. Horizontal and other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).
2. At distances between control joints of not greater than 18 feet (5.5 m) o.c.
3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
4. Where control joints occur in surface of construction directly behind plaster.
5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

3.5 PLASTER APPLICATION

- A. General: Comply with ASTM C 926.

3.6 STUCCO REPAIRS

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

END OF SECTION 092400

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:

1. Interior gypsum board.
2. Exterior gypsum board for walls, ceilings and soffits.
3. Tile backing panels.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

PART 2 - PRODUCTS

2.1 INTERIOR GYPSUM BOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Gypsum Co.
 - b. BPB America Inc.
 - c. G-P Gypsum.
 - d. Lafarge North America Inc.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. Temple.
 - h. USG Corporation.

- B. Regular Type:

1. Thickness: 5/8 inch.
2. Long Edges: Tapered.

C. Type X:

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

D. Moisture- and Mold-Resistant Type: With moisture- and mold-resistant core and surfaces.

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

E. Abuse-Resistant Type: With high-density core.

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

2.2 TILE BACKING PANELS

A. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M or ASTM C 1396/C 1396M.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Gypsum Co.
 - b. BPB America Inc.
 - c. G-P Gypsum.
 - d. Lafarge North America Inc.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. Temple.
 - h. USG Corporation.
2. Core: 5/8 inch (15.9 mm), Type X.

B. Glass-Mat, Water-Resistant Backing Board:

1. Complying with ASTM C 1178/C 1178M.
 - a. Product: Subject to compliance with requirements, provide "DensShield Tile Guard" by G-P Gypsum.

2.3 EXTERIOR GYPSUM BOARD FOR WALLS, CEILINGS AND SOFFITS

A. Exterior Gypsum Soffit Board: ASTM C 931/C 931M or ASTM C 1396/C 1396M, with manufacturer's standard edges.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum Co.
 - b. BPB America Inc.
 - c. G-P Gypsum.
 - d. Lafarge North America Inc.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. Temple.
 - h. USG Corporation.
3. Core: 5/8 inch (15.9 mm), Type X.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Plastic.
2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.
 - g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Wallboard: Paper.
2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
3. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

- a. Use setting-type compound for installing paper-faced metal trim accessories.
- 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
- 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
- D. Joint Compound for Tile Backing Panels:
 - 1. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

3.2 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Regular Type: Vertical surfaces, unless otherwise indicated.
 - 2. Type X: Where required for fire-resistance-rated assembly.
 - 3. Moisture- and Mold-Resistant Type: Within 5' 2" of plumbing fixtures and on existing CMU walls.
 - 4. Abuse-Resistant Type: In residential areas of second floor.

3.3 APPLYING TILE BACKING PANELS

- A. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in other Division 09 Sections.
- E. Glass-Mat, Water-Resistant Backing Panels: Finish according to manufacturer's written instructions.

3.6 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or blotchy surface contamination and discoloration.

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END OF SECTION 092900

GYPSUM BOARD

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SECTION 093000 - TILING

PART 1 - PRODUCTS

1.1 TILE PRODUCTS

A. Available Manufacturers:

1. American Olean; Div. of Dal-Tile International Corp.
2. Buchtal Corporation USA.
3. Crossville Ceramics Company, L.P.
4. Daltile; Div. of Dal-Tile International Inc.
5. Florida Tile Industries, Inc.
6. Interceramic.
7. Metropolitan Ceramics.
8. Monarch Tile, Inc.
9. Porcelanite, Inc.
10. Quarry Tile Company.
11. Summitville Tiles, Inc.
12. United States Ceramic Tile Company.

B. ANSI Ceramic Tile Standard: Provide Standard grade tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.

C. Unglazed Ceramic Mosaic Tile CT-1: Factory-mounted flat tile as follows:

1. Composition: Porcelain.
2. Surface: Slip-resistant, with abrasive admixture.
3. Module Size: 12" by 12 inches.
4. Basis-of-Design Product: Interceramic-Intertech Ararat or a comparable product of one of the following:

D. Glazed Wall Tile CT-2: Flat tile as follows:

1. Module Size: 6 by 6 inches (152 by 152 mm).
2. Basis-of-Design Product: Interceramic Wall Tile Collection or a comparable product of one of the following:

E. Glazed Wall Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing where applicable.

1. Base: Coved, module size 6 by 6 inches (152 by 152 mm).
2. Wainscot Cap: Bullnose, module size 6 by 6 inches (152 by 152 mm).
3. External Corners: Bullnose.
4. Internal Corners: Field-buttet square corners except with coved base and cap angle pieces designed to fit with stretcher shapes.

1.2 ACCESSORY MATERIALS

- A. Thresholds: Fabricate to provide transition between adjacent floor finishes. Bevel edges at 1:2 slope, limit height of bevel to 1/2 inch (12.7 mm) or less, and finish bevel to match face of threshold.
 - 1. Marble Thresholds: ASTM C 503 with a minimum abrasion resistance of **12** per ASTM C 1353 or ASTM C 241 and with honed finish.

1.3 SETTING AND GROUTING MATERIALS

- A. Available Manufacturers:
 - 1. Atlas Minerals & Chemicals, Inc.
 - 2. Boiardi Products Corporation.
 - 3. Bonsal, W. R., Company.
 - 4. Bostik.
 - 5. C-Cure.
 - 6. Custom Building Products.
 - 7. DAP, Inc.
 - 8. Jamo Inc.
 - 9. LATICRETE International Inc.
 - 10. MAPEI Corporation.
 - 11. Southern Grouts & Mortars, Inc.
 - 12. Summitville Tiles, Inc.
 - 13. TEC Specialty Products Inc.
- B. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.1A.
- C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
 - 1. Prepackaged dry-mortar mix containing dry additive to which only water must be added.
 - 2. Prepackaged dry-mortar mix combined with liquid-latex additive.
 - 3. For wall applications, provide non-sagging mortar.
- D. Water-Cleanable, Tile-Setting Epoxy Adhesive: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- E. Standard Sanded Cement Grout: ANSI A118.6, color as indicated.
- F. Standard Un-Sanded Cement Grout: ANSI A118.6, color as indicated.

PART 2 - EXECUTION

2.1 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. At showers, tubs, and where indicated, install cementitious backer units and treat joints to comply with ANSI A108.11.
- D. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.
 - 1. Exterior tile floors.
 - 2. Tile floors in wet areas.
 - 3. Tile swimming pool decks.
 - 4. Tile floors in laundries.
 - 5. Tile floors composed of tiles 8 by 8 inches (200 by 200 mm) or larger.
 - 6. Tile floors composed of rib-backed tiles.

2.2 FLOOR TILE INSTALLATION SCHEDULE

- A. Interior floor installation on concrete; thin-set mortar; TCA F113.
 - 1. Thin-Set Mortar: Latex- Portland cement mortar.
 - 2. Grout: Polymer-modified sanded grout.
- B. Interior floor installation on concrete; water-cleanable epoxy adhesive; TCA F116.
 - 1. Grout: Polymer-modified sanded grout.

2.3 WALL TILE INSTALLATION SCHEDULE

- A. Interior wall installation over masonry or concrete; thin-set mortar; TCA W202.
 - 1. Thin-Set Mortar: Latex- Portland cement mortar.
 - 2. Grout: Polymer-modified sanded grout.
- B. Interior wall installation; thin-set mortar; over cementitious backer units; TCA W244.
 - 1. Thin-Set Mortar: Latex- Portland cement mortar.
 - 2. Grout: Polymer-modified sanded grout.
- C. Interior bathtub wall installation; thin-set mortar; over cementitious backer units; TCA B412.
 - 1. Thin-Set Mortar: Latex-Portland cement mortar.
 - 2. Grout: Polymer-modified sanded grout.

END OF SECTION 093000

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes acoustical panels and exposed suspension systems for ceilings.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each exposed finish.
- C. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics:
 - 1. Surface-Burning Characteristics: Acoustical panels complying with ASTM E 1264 for Class A materials, when tested per ASTM E 84.
 - a. Smoke-Developed Index: 450 or less.

PART 2 - PRODUCTS

2.1 ACOUSTICAL PANEL CEILINGS, GENERAL

- A. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 - 1. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.
- B. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 1. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.

- C. Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.

2.2 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Armstrong World Industries, Inc.
 - 2. BPB USA.
 - 3. Chicago Metallic Corporation.
 - 4. Ecophon CertainTeed, Inc.
 - 5. Tectum Inc.
 - 6. USG Interiors, Inc.
 - 7. Rockfon LLC
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Rockfon "Alaska"
- C. Classification: Provide panels complying with ASTM E 1264 for type and form as follows:
 - 1. Type and Form: Type XX, other types; described as high-density, ceramic- and mineral-base panels with scrubbable finish, resistant to heat, moisture, and corrosive fumes.
- D. Color: White.
- E. LR: Not less than .86.
- F. NRC: Not less than .90.
- G. CAC: Not less than 22.
- H. AC: Not less than 180.
- I. Edge/Joint Detail: Square.
- J. Thickness: 3/4 inch (19 mm).
- K. Modular Size: 24 by 24 inches (610 by 610 mm).

2.3 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- B. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. BPB USA.
 - 3. Chicago Metallic Corporation.

4. Ecophon CertainTeed, Inc.
 5. USG Interiors, Inc.
 6. Rockfon LLC
- C. Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation, with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges.
1. Structural Classification: Heavy-duty system.
 2. End Condition of Cross Runners: Override (stepped) type.
 3. Cap Material: Steel cold-rolled sheet.
 4. Cap Finish: Painted white.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with ASTM C 636, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders.
- C. Suspend ceiling hangers from building's structural members, plumb and free from contact with insulation or other objects within ceiling plenum. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers, use trapezes or equivalent devices. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.
- E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

END OF SECTION 095113

SECTION 096516 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vinyl sports floor covering.
 - 2. Playground Turf.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each type of floor covering. Include floor covering layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
- C. Samples: In manufacturer's standard size, but not less than 6-by-9-inch (150-by-230-mm) sections of each different color and pattern of floor covering required.
- D. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.4 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive floor coverings.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.
- C. Close spaces to traffic during floor covering installation.
- D. Close spaces to traffic for 48 hours after floor covering installation.
- E. Install floor coverings after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 VINYL SHEET FLOOR COVERING

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis of Design: Tarkett, Inc.: Omnisports 7.1 min:
 - 1. Armstrong World Industries, Inc.
 - 2. Congoleum Corporation.
 - 3. Forbo Flooring, Inc.
 - 4. Mannington Mills, Inc.
 - 5. Polyflor, Ltd., Distributed by Gerbert Limited.
- C. Vinyl Sheet Floor Covering with Backing: ASTM F 1303.
 - 1. Type (Binder Content): Type I, minimum binder content of 90 percent.
 - 2. Wear-Layer Thickness: PVC.
 - 3. Overall Thickness: As standard with manufacturer.
 - 4. Interlayer Material: PVC with interwoven fiberglass.
- D. Wearing Surface: Embossed with embedded abrasives.
- E. Sheet Width: 12 feet (3.6 m).
- F. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 PLAYGROUND TURF:

- A. Products: 90oz./sq. yd. polyethylene yarn artificial turf with 1" pile height with dual backing system and perforated holes for drainage.
- B. Basis of Design: Turf Factory Direct: TFD K-9 Supreme.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of floor coverings.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor coverings until they are same temperature as space where they are to be installed.
 1. Move floor coverings and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by floor coverings immediately before installation.

3.2 FLOOR COVERING INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor coverings.
- B. Unroll floor coverings and allow them to stabilize before cutting and fitting.
- C. Lay out floor coverings as follows:
 1. Maintain uniformity of floor covering direction.
 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (152 mm) away from parallel joints in floor covering substrates.
 3. Match edges of floor coverings for color shading at seams.
 4. Avoid cross seams.
- D. Scribe and cut floor coverings to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.
- E. Extend floor coverings into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, or openings that are in place or marked for future cutting by repeating on floor coverings as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Adhere floor coverings to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.3 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor covering.
- B. Cover floor coverings until Substantial Completion.

END OF SECTION 096516

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid Vinyl floor tile.
 - 2. Vinyl composition floor tile.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: Full-size units of each color and pattern of floor tile required.
- C. Maintenance data.

1.3 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive floor tile.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 SOLID VINYL FLOOR TILE

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Altro Group
 - 2. Amtico Studio (The), Amtico International Inc
 - 3. Armstrong World Industries, Inc
 - 4. Burke Mercer Flooring Products, Division of Burke Industries Inc
 - 5. Estrie Products International, American Biltrite (Canada) Ltd
 - 6. Flexco

7. Gemtec Inc
8. Gerflor, Architectural Floor Systems, Inc
9. Johnsonite
10. Polyflor, Ltd., Distributed by Gerbert Limited
11. Roppe Corporation, USA
12. Tarkett, Inc
13. TOLI International
14. VPI, LLC, Floor Products Division
15. Centiva; Victory Series

B. Tile Standard: ASTM F 1700.

1. Class: Class III, printed film vinyl tile.
2. Type: Type B, embossed surface.

C. Thickness: 0.120 inch (3.0 mm).

D. Size: 18 by 18 inches (457 by 457 mm).

E. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 VINYL COMPOSITION FLOOR TILE

A. Products: Subject to compliance with requirements, available manufacturers that may be incorporated into the Work include, but are not limited to, the following:

1. AB ColorPlus, American Biltrite (Canada) Ltd.
2. Armstrong World Industries, Inc
3. Congoleum Corporation.
4. Mannington Mills, Inc.
5. Tarkett, Inc.
6. Vinylasa Tile, Distributed by American Tile Inc.

B. Tile Standard: ASTM F 1066, Class 1, solid-color tile.

C. Wearing Surface: Smooth.

D. Thickness: 0.125 inch (3.2 mm).

E. Size: 12 by 12 inches (305 by 305 mm).

F. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

- B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.
 - 1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. VCT and Asphalt Tile Adhesives: Not more than 50 g/L.
- C. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are same temperature as space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.2 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles square with room axis.

- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles with grain direction alternating in adjacent tiles (basket-weave pattern).
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- G. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.3 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- B. Floor Polish: Remove soil, visible adhesive and surface blemishes from floor tile surfaces before applying liquid floor polish if required by manufacturer.
- C. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096723-RESINOUS FLOORING

PART 1 – GENERAL

1.2 SUMMARY

A. This section includes the following:

1. Resinous flooring system as shown on the drawings and in schedules.

1.3 SYSTEM DESCRIPTION

- A. The work shall consist of preparation of the substrate, the furnishing and application of a cementitious urethane based self-leveling seamless flooring system with decorative quartz aggregate broadcast and Epoxy broadcast and topcoats.
- B. The system shall have the color and texture as specified by the Owner with a nominal thickness of 1/4 inch. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.
- C. Cove base (if required) to be applied where noted on plans and per manufacturers standard details unless otherwise noted

1.4 SUBMITTALS

- A. Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.
- B. Manufacturer's Material Safety Data Sheet (MSDS) for each product being used.
- C. Samples: A 3 x 3-inch square sample of the proposed system. Color, texture, and thickness shall be representative of overall appearance of finished system subject to normal tolerances.

1.5 QUALITY ASSURANCE

- A. The Manufacturer shall have a minimum of 10 years experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.
- B. The Applicator shall have experience in installation of the flooring system as confirmed by the manufacturer in all phases of surface preparation and application of the product specified.
- C. A pre-installation conference shall be held between Applicator, General Contractor and the Owner to review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping
 1. All components of the system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the product type and batch number.
- B. Storage and Protection
 1. The Applicator shall be provided with a dry storage area for all components. The area shall be between 60 F and 85 F, dry, out of direct sunlight and in accordance with the Manufacturer's recommendations and relevant health and safety regulations.

1.7 PROJECT CONDITIONS

A. Site Requirements

1. Application may proceed while air, material and substrate temperatures are between 60 F and 85 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.
3. The Applicator shall ensure that adequate ventilation is available for the work area. This shall include the use of manufacturer's approved fans, smooth bore tubing and closure of the work area.
4. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.

B. Conditions of new concrete to be coated with cementitious urethane material.

1. Concrete shall be moisture cured for a minimum of 3 days and have fully cured a minimum of 5 days in accordance with ACI-308 prior to the application of the coating system pending moisture tests.
2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary nor desirable).
3. Sealers and curing agents should not be used.
4. Concrete shall have minimum design strength of 3,500 psi. and a maximum water/cement ratio of 0.45
5. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.

PART 2 – PRODUCTS

2.1 FLOORING

A. Dur-A-Flex, Inc, Hybri-Flex EQ (self leveling broadcast quartz), epoxy/aliphatic urethane topcoat seamless flooring system.

1. System Materials:
 - a. Topping: Dur-A-Flex, Inc, Poly-Crete MD resin, hardener and SL aggregate.
 - b. The broadcast aggregate shall be Dur-A-Flex, Inc. Q28 or Q11 quartz aggregate.
 - c. Broadcast: Dur-A-Flex, Inc. Dur-A-Glaze #4, epoxy based two-component resin.
 - d. Grout coat: Dur-A-Flex, Inc Dur-A-Glaze #4, epoxy-based, two-component resin.
 - e. Top coat: Dur-A-Flex, Inc. Armor Top aliphatic urethane two-component resin.
2. Patch Materials
 - a. Shallow Fill and Patching: Use Dur-A-Flex, Inc. Poly-Crete MD (up to ¼ inch).
 - b. Deep Fill and Sloping Material (over ¼ inch): Use Dur-A-Flex, Inc. Poly-Crete WR.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.
- 1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

3.2 PREPARATION

A. General

- 1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
- 2. Moisture Testing: Perform tests recommended by manufacturer and as follows.
 - a. Perform anhydrous calcium chloride test ASTM F 1869-98. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 20 lbs/1,000 sf/24 hrs.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 99% relative humidity level measurement.
 - c. If the vapor drive exceeds 99% relative humidity or 20 lbs/1,000 sf/24 hrs then the Owner and/or Engineer shall be notified and advised of additional cost for the possible installation of a vapor mitigation system that has been approved by the manufacturer or other means to lower the value to the acceptable limit.
- 3. Mechanical surface preparation
 - a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-5 as described by the International Concrete Repair Institute.
 - b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
 - c. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 1/4-inch key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.
 - d. Cracks and joints (non-moving) greater than 1/8-inch-wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.
- 4. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufacturer's recommendations.

3.3 APPLICATION

A. General

1. The system shall be applied in five distinct steps as listed below:
 - a. Substrate preparation
 - b. Topping/overlay application with quartz aggregate broadcast.
 - c. Resin application with quartz aggregate broadcast.
 - d. Topcoat application
 - e. Second topcoat application.
2. Immediately prior to the application of any component of the system, the surface shall be dry, and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Topping

1. The topping shall be applied as a self-leveling system as specified by the Architect. The topping shall be applied in one lift with a nominal thickness of 1/8 inch.
2. The topping shall be comprised of three components, a resin, hardener and filler as supplied by the Manufacturer.
3. The hardener shall be added to the resin and thoroughly dispersed by suitably approved mechanical means. SL Aggregate shall then be added to the catalyzed mixture and mixed in a manner to achieve a homogenous blend.
4. The topping shall be applied over horizontal surfaces using ½ inch “v” notched squeegee, trowels or other systems approved by the Manufacturer.
5. Immediately upon placing, the topping shall be degassed with a loop roller.
6. Quartz aggregate shall be broadcast to excess into the wet material at the rate of 0.8 lbs/sf.
7. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

C. Broadcast

1. The broadcast coat resin shall be applied at the rate of 90 sf/gal (Q28) or 50 sf/gal (Q11).
2. The broadcast coat shall be comprised of liquid components, combined at a ratio of 2 parts resin to 1-part hardener by volume and shall be thoroughly blended by mechanical means such as a high-speed paddle mixer.
3. Quartz aggregate shall be broadcast into the wet resin at the rate of 0.5 lbs/sf.
4. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

D. Grout coat

1. The grout coat shall be squeegee applied with a coverage rate of 90 sf/gal (Q28) or 50 sf/gal (Q11).
2. The grout coat shall be comprised of liquid components, combined at a ratio of 2 parts resin to 1-part hardener by volume and shall be thoroughly blended by mechanical means such as a high-speed paddle mixer.

3. The grout coat will be back rolled and cross rolled to provide a uniform texture and finish.

E. Topcoat

1. The topcoat shall be roller applied with a coverage rate of 500 sf/gal.
2. The finished floor will have a nominal thickness of 1/4 inch.

3.5 CLEANING AND PROTECTION

- A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
- B. Remove masking. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

END OF SECTION 096723

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes modular, fusion-bonded carpet tile.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show the following:
 - 1. Carpet tile type, color, and dye lot.
 - 2. Pattern of installation.
 - 3. Insets and borders.
 - 4. Edge, transition, and other accessory strips.
 - 5. Transition details to other flooring materials.
- C. Samples: For each color and texture required.
 - 1. Carpet Tile: Full-size Sample.
 - 2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.
- E. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.
- B. Mockups: Before installing carpet tile, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104, Section 5, "Storage and Handling."

1.5 PROJECT CONDITIONS

- A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."
- B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.6 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.

- 1. Warranty Period: 10 years from date of Substantial Completion.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd. (8.3 sq. m).

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- B. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Shaw No Rules Collection
 - a. Color: As selected by Architect from manufacturer's full range.
 - b. Pattern: Color Play

c. Source: Shaw Contract Group, shawcontractgroup.com, 1-800-257-7429

- C. Fiber Content: 100 percent nylon 6, 6
- D. Pile Characteristic: Level-loop pile.
- E. Density: 18.0 oz./cu. yd. (g/cu. cm.)
- F. Pile Thickness: 0.085 inches (2.16 mm) for finished carpet tile [per ASTM D 6859.
- G. Stitches: 9 stitches per inch (mm).
- H. Gage: 1/2 ends per inch (mm).
- I. Primary Backing/Backcoating: Reinforced thermoplastic copolymer.
- J. Secondary Backing: Manufacturer's standard material.
- K. Size: 24 by 24 inches (610 by 610 mm).
- L. Applied Soil-Resistance Treatment: Manufacturer's standard material.
- M. Antimicrobial Treatment: Manufacturer's standard material.
- N. Performance Characteristics: As follows:
 - 1. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm.
 - 2. Dry Breaking Strength: Not less than 100 lbf (445 N) per ASTM D 2646.
 - 3. Tuft Bind: Not less than 3 lbf (13 N) per ASTM D 1335.
 - 4. Delamination: Not less than 3.5 lbf/in. (15 N/mm) per ASTM D 3936.
 - 5. Dimensional Tolerance: Within 1/32 inch (0.8 mm) of specified size dimensions, as determined by physical measurement.
 - 6. Dimensional Stability: 0.2 percent or less per ISO 2551 (Aachen Test).
 - 7. Resistance to Insects: Comply with AATCC 24.
 - 8. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria; not less than 1-mm halo of inhibition for gram-negative bacteria; no fungal growth; per AATCC 174.
 - 9. Electrostatic Propensity: Less than 3.5 kV per AATCC 134.
 - 10. Environmental Requirements: Provide carpet tile that complies with testing and product requirements of Carpet and Rug Institute's "Green Label Plus" program.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.

1. VOC Limits: Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by carpet tile manufacturer.
- C. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- D. Install pattern parallel to walls and borders.

END OF SECTION 096813

SECTION 099110 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes surface preparation and field painting of exposed exterior and items and surfaces, including but not limited to soffit canopy, gable ends, stucco, exposed structural steel, awning window frames, steel doors and frames.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1.2 SUBMITTALS

- A. Product Data: For each paint system indicated. Include block fillers and primers.
- B. Samples for Initial Selection: For each type of finish-coat material indicated.
- C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
 - 1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.

1.5 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).
- B. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.
- B. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Benjamin Moore & Co. (Benjamin Moore). Basis-of-Design unless otherwise noted
 - 2. Coronado Paint Company (Coronado). Basis of Design unless otherwise noted.
 - 3. Devoe Coatings. (Devoe)
- C. Coronado Paint Company will be shown in the specified systems. Products of manufacturer's listed above will be accepted meeting those specifications. Products of other manufacturer's not listed above shall not be accepted without written approval from the Architect.

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: As indicated by manufacturer's designations.

2.3 EXTERIOR PRIMERS

- A. Exterior Concrete and Masonry Primer: Factory-formulated alkali-resistant acrylic-latex primer for exterior application.
- B. Exterior Ferrous-Metal Primer: Factory-formulated rust-inhibitive metal primer for exterior application.
- C. Exterior non-ferrous or Galvanized Metal Primer: Factory-formulated galvanized metal primer for exterior application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - 2. Cementitious Materials: Power-wash concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - 3. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
 - 4. Non-ferrous or Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
 - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 - 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
 - 1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
 - 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 - 3. Provide finish coats that are compatible with primers used.
 - 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
 - 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 - 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 - 8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
 - 9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
 - 10. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 - 1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 - 2. Omit primer over metal surfaces that have been shop primed and touchup painted.
 - 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special

- attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
- F. Mechanical items to be painted include, but are not limited to, the following:
1. Uninsulated metal piping.
 2. Uninsulated plastic piping.
 3. Pipe hangers and supports.
 4. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.
- G. Electrical items to be painted include, but are not limited to, the following:
1. Switchgear.
 2. Panelboards.
 3. Electrical equipment that is indicated to have a factory-primed finish for field painting.
- H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- I. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

- K. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:
 - 1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
 - 2. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
 - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 EXTERIOR PAINT SCHEDULE

- A. Concrete, Stucco, EIFS, and Masonry (Other Than Concrete Unit Masonry): Provide the following finish systems over exterior concrete, stucco, and brick masonry substrates:
 - 1. Low-Luster Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Exterior concrete and masonry primer: Basis-of-Design: Ultra Spec High-Build Sealer 609.

- b. Finish Coats: Exterior low-luster acrylic paint: Basis-of-Design: Ultra Spec EXT Satin N448.
- B. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items. Basis-of-Design: Corotech V180, Rust Arrestor over rusted surfaces and Corotech V160 Epoxy Mastic. Structural Steel only: 35-147 Primer Alkyd Red Rust Scat.
 - 1. Semigloss Acrylic-Enamel Finish: Two finish coats over a rust-inhibitive primer.
 - a. Primer: Exterior ferrous-metal primer. Corotech Acrylic Metal Primer V110.
 - b. Finish Coats: Exterior semigloss acrylic enamel: Coronado Rust Scat Enamel 90 Line.
- C. Non-ferrous and Galvanized Metal: Provide the following finish systems over exterior zinc-coated metal surfaces:
 - 1. Full-Gloss Acrylic-Enamel Finish: Two finish coats over a galvanized metal primer.
 - a. Primer: Exterior galvanized metal primer. Basis-of-Design: Corotech Acrylic Metal Primer V110.
 - b. Finish Coats: Exterior full-gloss acrylic enamel for ferrous and other metals Basis-of-Design: Coronado Rust Scat Enamel 80 Line.

Interior Paint Schedule:

Concrete Masonry Units:

- 1. Acrylic Finish, two coats over block filler:
 - a. Block Filler; Coronado by Benjamin Moore Super Kote 5000 Block Filler 958 line.
 - b. Second and Third Coats: Ultra Spec SCUFF-X Interior Satin finish 486.
 - c. Sheen: Satin.

Gypsum Drywall:

- 1. Walls:
 - a. Primer: 1 coat of Benjamin Moore Prep-Coat Hi Build Primer 580.
 - b. Second and Third Coats: Ultra Spec SCUFF-X Interior Satin finish 486.
 - c. Sheen: Satin.
- 2. Ceilings:
 - a. Primer: 1 coat of Benjamin Moore Prep-Coat Hi Build Primer 580.
 - b. Second & Third Coats: Coronado by Benjamin Moore Super Kote 5000 Flat 28 line.
 - c. Sheen: Flat.

Hollow Metal Doors and Frames-Int/Ext Ferrous & Non-ferrous Metal:

- 1. Acrylic-Enamel Finish:
 - a. Primer: Spot coat of Corotech Acrylic Metal Primer V110.
 - b. Second and Third Coats: Corotech Rust Scat Enamel 90 line.
 - c. Sheen: Semi-Gloss.

D. Manufacturers and Suppliers Responsibilities:

1. Monitoring of critical phase points i.e.; cleaning, priming/sealing, caulking, and finishing will be performed periodically by either the manufacturer's rep. or the supplier's rep. The monitoring process will be random and unannounced. The monitoring process is strictly for the benefit and comfort of the Paint Company and the supplier. This is not an inspection that certifies conformance of the specification. A third party independent inspector should be employed by the Owner or Association for certified application inspection.
2. A final review of the project will be performed at the completion of the job, no warranty will be issued until a final review has been completed. This final review confirms that the products used are as specified.

E. Warranty Information:

1. (7) Seven Year, Non-Prorated, Limited Material and Labor Warranty Warrants that the materials used, as manufactured by Benjamin Moore, Coronado or Devoe Paints, are manufactured to specification and free from defects. These specified coatings will not flake, crack, peel, or blister when applied to a properly prepared masonry substrate, due to a material defect. This warranty does not apply to the condition of or to any failure of the pre-existing paints or any pre-existing structural defects. There is no warranty on metal or against rust or corrosion of metals, or discoloration from masonry alkalinity burn. Substrate repairs and mechanical damage of paint is not covered under warranty.

END OF SECTION 099110

SECTION 101400 - SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:

- 1. Plaques.

1.2 DEFINITIONS

- A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for signs.
 - 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
 - 2. Provide message list, typestyles, graphic elements including tactile characters and Braille, and layout for each sign.
- C. Samples: For each sign type and for each color and texture required.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

2.2 PANEL SIGNS

- A. Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner, complying with the following requirements:
 - 1. Acrylic Sheet: 0.060 inch (1.52 mm) thick.
 - 2. Edge Condition: Square cut.
 - 3. Corner Condition: Rounded to radius indicated.
 - 4. Mounting: Framed.
 - 5. Color: As indicated.
 - 6. Tactile Characters: Characters and Grade 2 Braille raised 1/32 inch (0.8 mm) above surface with contrasting colors.
- B. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils (0.076 mm) with pressure-sensitive adhesive backing. Apply copy to exposed face of panel sign.
 - 1. Panel Material: Opaque acrylic sheet.

2.3 ACCESSORIES

- A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.4 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.
 - 1. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
 - 2. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.5 ACRYLIC SHEET FINISHES

- A. Colored Coatings for Acrylic Sheet: For copy, background and frame colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for five years for application intended.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
- B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
1. Two-Face Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.

END OF SECTION 101400

SECTION 102113 - TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-polymer toilet compartments configured as toilet enclosures and urinal screens.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for each exposed product and for each color and texture specified.

1.3 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: 200 or less.
 2. Smoke-Developed Index: 450 or less.
- B. Regulatory Requirements: Comply with applicable provisions in "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" for toilet compartments designated as accessible.

PART 2 - PRODUCTS

2.1 SOLID-POLYMER UNITS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Accurate Partitions Corporation.
 2. Ampco, Inc.
 3. Bradley Corporation; Mills Partitions.
 4. Comtec Industries/Capitol Partitions.
 5. General Partitions Mfg. Corp.

6. Global Steel Products Corp.
7. Hadrian Manufacturing Inc.
8. Knickerbocker Partition Corporation.
9. Metpar Corp.
10. Partition Systems Incorporated of South Carolina.
11. Rockville Partitions Incorporated.
12. Santana Products, Inc.
13. Sanymetal; a Crane Plumbing company.
14. Weis-Robart Partitions, Inc.

B. Toilet-Enclosure Style: Overhead braced

C. Urinal-Screen Style: Wall hung.

D. Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch (25 mm) thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.

1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
2. Heat-Sink Strip: Manufacturer's standard continuous, stainless-steel strip fastened to exposed bottom edges of solid-polymer components to prevent burning.
3. Polymer Panel Finish: One color and pattern in each room.

a. Color and Pattern: As indicated by manufacturer's designations.

E. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; stainless steel.

F. Urinal-Screen Post: Manufacturer's standard post design of material matching the thickness and construction of pilasters; with shoe and sleeve (cap) matching that on the pilaster.

G. Brackets (Fittings):

1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.

2.2 ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.

1. Material: Stainless steel.
2. Hinges: Manufacturer's standard paired, self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees.
3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.

- 5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
 - 6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with anti-grip profile and in manufacturer's standard finish.
- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

2.3 FABRICATION

- A. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- B. Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.
- C. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment at bottoms of posts. Provide shoes at posts to conceal anchorage.
- D. Door Size and Swings: Unless otherwise indicated, provide 24-inch- (610-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
- B. Clearances: Maximum 1/2 inch (13 mm) between pilasters and panels; 1 inch (25 mm) between panels and walls.
- C. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than three brackets attached at midpoint and near top and bottom of panel. Locate wall brackets so holes for wall anchors occur in masonry or tile joints. Align brackets at pilasters with brackets at walls.

3.2 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION 102113

SECTION 102226 - OPERABLE PARTITIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manually operated, acoustical panel partitions.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design operable panel partitions including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:
 1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance according to ASTM E 90, determined by ASTM E 413, and rated for not less than the STC indicated.
 2. Acoustical Performance Requirements: Installed operable panel partition assembly, identical to partition tested for STC, tested for NIC according to ASTM E 336, determined by ASTM E 413, and rated for 10 dB less than STC value indicated 45dB.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 1. Indicate storage and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.
 2. Wiring Diagrams: For power, signal, and control wiring.
- C. Samples: For each type of exposed material, finish, covering, or facing indicated.
- D. Delegated-Design Submittal: For operable panel partitions indicated to comply with performance requirements, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Design Calculations: Calculate requirements for seismic restraints.
- E. Coordination Drawings: Reflected ceiling plans, drawn to scale and coordinated with each other, based on input from installers of the items involved:

- F. Setting Drawings: For embedded items and cutouts required in other work, including support-beam, mounting-hole template.
- G. Seismic Qualification Certificates: For operable panel partitions, accessories, and components, from manufacturer.
- H. Product certificates.
- I. Product test reports.
- J. Field quality-control reports.
- K. Operation and maintenance data.
- L. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.
- B. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- C. Testing Agency Qualifications: Qualified according to Division 01 Section "Quality Requirements" for testing indicated.
- D. Forest Certification: Fabricate products with wood, wood veneers, and wood-based panel products produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- E. Fire-Test-Response Characteristics: Provide panels with finishes meeting one of the following as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Surface-Burning Characteristics: As determined by testing per ASTM E 84.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 2. Fire Growth Contribution: Meeting acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265.
- F. Fire-Rated Door Assemblies: Comply with NFPA 80, based on testing according to UL 10B.
 - 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
- G. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- H. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel Frame: Steel sheet, manufacturer's standard thickness.
- B. Steel Face/Liner Sheets: Tension-leveled steel sheet, manufacturer's standard thickness.
- C. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use, corrosion resistance, and finish indicated; manufacturer's standard strengths and thicknesses for type of use.
- D. Particleboard: ANSI A208.1, made with binder containing no urea formaldehyde.
- E. Medium-Density Fiberboard: ANSI A208.2, made with binder containing no urea formaldehyde.

2.2 OPERABLE ACOUSTICAL PANELS

- A. Operable Acoustical Panels: Operable acoustical panel partition system, including panels, seals, finish facing, suspension system, operators, and accessories.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Basis-of-Design Product: Subject to compliance with requirements, provide Hufcor or comparable product by one of the following:
 - a. Advanced Equipment Corporation.
 - b. Curtition, Inc.
 - c. FolDoor; Holcomb & Hoke Mfg. Co., Inc.

- d. KWIK-WALL Company.
 - e. Moderco Inc.
 - f. Modernfold, Inc.; a DORMA Group Company.
 - g. Panelfold Inc.
- B. Panel Operation: Manually operated, paired panels.
- C. Panel Construction: Provide top reinforcement as required to support panel from suspension components and provide reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.
- D. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.
- E. STC: Not less than 45.
- F. Panel Closure: Manufacturer's standard.
- G. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.

2.3 SEALS

- A. General: Provide types of seals indicated that produce operable panel partitions complying with acoustical performance requirements and the following:
 - 1. Manufacturer's standard seals.
 - 2. Seals made from materials and in profiles that minimize sound leakage.
 - 3. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.
- B. Horizontal Bottom Seals: PVC-faced, mechanical, retractable, constant-force-contact seal exerting uniform constant pressure on floor when extended, ensuring horizontal and vertical sealing and resisting panel movement.
 - 1. Mechanically Operated for Acoustical Panels: Extension and retraction of bottom seal by operating handle or built-in operating mechanism, with operating range not less than 1-1/2 inches (38 mm) between retracted seal and floor finish.

2.4 FINISH FACING

- A. General: Provide finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.
 - 1. Color/Pattern: As selected by Architect from manufacturer's full range.

- B. High-Pressure Decorative Laminate: NEMA LD 3, Horizontal grade.
- C. Cap-Trimmed Edges: Protective perimeter-edge trim with tight hairline joints concealing edges of panel and finish facing.
- D. Trimless Edges: Fabricate exposed panel edges so finish facing wraps uninterrupted around panel, covering edge and resulting in an installed partition with facing visible on vertical panel edges, without trim, for minimal sightlines at panel-to-panel joints.

2.5 SUSPENSION SYSTEMS

- A. Suspension Tracks: Steel or aluminum with adjustable steel hanger rods for overhead support, designed for type of operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch (2.54 mm) between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.
- B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.
- C. Track Intersections, Switches, and Accessories: As required for type of operation, storage, track configuration, and layout indicated for operable panel partitions, and compatible with partition assembly specified. Fabricate track intersections and switches from steel or aluminum.
 - 1. Multidirectional Switches: Adjustable switch configuring track into L, T, or X intersections and allowing panels to be moved in all pass-through, 90-degree change, and cross-over travel direction combinations.
- D. Aluminum Finish: Mill finish or manufacturer's standard, factory-applied, decorative finish unless otherwise indicated.
- E. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.

2.6 ACCESSORIES

- A. Storage Pocket Door: Full height at end of partition runs to conceal stacked partition; of same materials, finish, construction, thickness, and acoustical qualities as panels; complete with operating hardware and acoustical seals at soffit, floor, and jambs. Hinges in finish to match other exposed hardware.
- B. Work Surfaces: Quantities, placement, and size indicated.
 - 1. Surface: Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with ASTM E 557 except as otherwise required by operable panel partition manufacturer's written installation instructions.
- B. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed.
- C. Install panels from marked packages in numbered sequence indicated on Shop Drawings.
- D. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.
- E. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.

3.2 ADJUSTING

- A. Adjust operable panel partitions to operate smoothly, without warping or binding. Lubricate hardware and other moving parts.
- B. Adjust storage pocket doors to operate smoothly and easily, without binding or warping. Check and readjust operating hardware. Confirm that latches and locks engage accurately and securely without forcing or binding.

3.3 FIELD QUALITY CONTROL

- A. Light-Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids; adjust partitions for acceptable fit.
- B. Testing Methodology: Perform testing of installed operable panel partition for noise isolation according to ASTM E 336, determined by ASTM E 413, and rated for not less than NIC indicated. Adjust and fit partitions to comply with NIC test method requirements.
- C. Repair or replace operable panel partitions that do not comply with requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of repaired, replaced, or additional work with specified requirements.
- E. Prepare test and inspection reports.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

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END OF SECTION 102226

OPERABLE PARTITIONS

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SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Public-use washroom accessories.
2. Childcare accessories.
3. Underlavatory guards.
4. Custodial accessories.

B. Owner-Furnished Material: Toilet Tissue Dispenser, Soap Dispenser, and Paper Towel Dispenser.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify products using designations indicated.

C. Maintenance data.

D. Warranty: Sample of special warranty.

1.3 WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PUBLIC-USE WASHROOM ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. A & J Washroom Accessories, Inc.
2. American Specialties, Inc.
3. Bobrick Washroom Equipment, Inc.
4. Bradley Corporation.
5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
6. Tubular Specialties Manufacturing, Inc.

B. Grab Bar:

1. Basis-of-Design Product: Bobrick "B-6806".
2. Mounting: Flanges with exposed fasteners.
3. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
 - a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
4. Outside Diameter: 1-1/4 inches (32 mm).
5. Configuration and Length: As indicated on Drawings.

C. Mirror Unit:

1. Basis-of-Design Product: Bobrick "B-165 series".
2. Frame: Stainless-steel channel. Retain first subparagraph below if required.
3. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.

D. Sanitary-Napkin Disposal Unit:

1. Basis-of-Design Product: Bobrick "B-270".
2. Mounting: Surface mounted.
3. Door or Cover: Self-closing, disposal-opening cover.
4. Receptacle: Removable.
5. Material and Finish: Stainless Steel

2.2 PRIVATE-USE SHOWER ROOM ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. A & J Washroom Accessories, Inc.
 2. American Specialties, Inc.
 3. Bobrick Washroom Equipment, Inc.
 4. Bradley Corporation.
 5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
 6. Tubular Specialties Manufacturing, Inc.

2.3 PRIVATE-USE BATHROOM ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Basco, Inc.
 2. Bobrick Washroom Equipment, Inc.
 3. Franklin Brass by Liberty Hardware Manufacturing Corporation; a Masco company.
 4. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
 5. Ginger; a Masco company.
 6. Seachrome Corporation.
 7. Tubular Specialties Manufacturing, Inc.
- B. Towel Bar:
1. Basis-of-Design Product: Bobrick "B-205".
 2. Description: 3/4-inch- (19-mm-) square tube with rectangular end brackets.
 3. Mounting: Flanges with exposed fasteners.
 4. Length: 24 inches (610 mm).
 5. Material and Finish: Stainless steel, No. 4 finish (satin).

2.4 CHILDCARE ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. American Specialties, Inc.
 2. Brocar Products, Inc.
 3. Diaper Deck & Company, Inc.
 4. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
 5. Koala Kare Products; a division of Bobrick Washroom Equipment, Inc.
 6. SSC, Inc.
 7. Tubular Specialties Manufacturing, Inc.
- B. Diaper-Changing Station:
1. Basis-of-Design Product: Bobrick "B-2200".
 2. Description: Vertical unit that opens by folding down from stored position and with child-protection strap.
 - a. Engineered to support a minimum of 250-lb (113-kg) static load when opened.
 3. Mounting: Surface mounted, with unit projecting not more than 4 inches (100 mm) from wall when closed.
 4. Operation: By pneumatic shock-absorbing mechanism.
 5. Material and Finish: HDPE in manufacturer's standard color.
 6. Liner Dispenser: Built in.

2.5 UNDERLAVATORY GUARDS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Plumberex Specialty Products, Inc.
 - 2. Truebro by IPS Corporation.
- B. Underlavatory Guard:
 - 1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
 - 2. Material and Finish: Antimicrobial, molded plastic, white.

2.6 CUSTODIAL ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. A & J Washroom Accessories, Inc.
 - 2. American Specialties, Inc.
 - 3. Bobrick Washroom Equipment, Inc.
 - 4. Bradley Corporation.
 - 5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
 - 6. Tubular Specialties Manufacturing, Inc.
- B. Utility Shelf:
 - 1. Description: With exposed edges turned down not less than 1/2 inch (13 mm) and supported by two triangular brackets welded to shelf underside.
 - 2. Size: 16 inches (406 mm) long by 6 inches (152 mm) deep.
 - 3. Material and Finish: Not less than nominal 0.05-inch- (1.3-mm-) thick stainless steel, No. 4 finish (satin).
- C. Mop and Broom Holder:
 - 1. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
 - 2. Length: 36 inches (914 mm).
 - 3. Hooks: Three.
 - 4. Mop/Broom Holders: Four, spring-loaded, rubber hat, cam type.
 - 5. Material and Finish: Stainless steel, No. 4 finish (satin).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units' level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F 446.

END OF SECTION 102800

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers as shown on Life Safety Plan.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Operation and maintenance data.
- C. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
- C. Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each mounting bracket indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Amerex Corporation.
 - b. Ansul Incorporated; Tyco International Ltd.
 - c. Badger Fire Protection; a Kidde company.
 - d. Buckeye Fire Equipment Company.
 - e. Fire End & Croker Corporation.
 - f. J. L. Industries, Inc.; a division of Activar Construction Products Group.
 - g. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
 - h. Larsen's Manufacturing Company.
 - i. Moon-American.
 - j. Pem All Fire Extinguisher Corp.; a division of PEM Systems, Inc.
 - k. Potter Roemer LLC.
 - l. Pyro-Chem; Tyco Safety Products.
 2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.
- B. Multipurpose Dry-Chemical Type: UL-rated 3A-40B: C nominal capacity, with monoammonium phosphate-based dry chemical in manufacturer's standard enameled container.
- C. Carbon Dioxide Type: UL-rated 5BC capacity, with carbon dioxide in manufacturer's standard enameled-metal container.

2.2 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.
- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine fire extinguishers for proper charging and tagging.
1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

1. Mounting Brackets: 54 inches (1372 mm) above finished floor to top of fire extinguisher.
- C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 104416

SECTION 105113 - METAL LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Athletic metal lockers.
2. Locker benches.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For metal lockers. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For units with factory-applied color finishes.
- D. Maintenance data.
- E. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements: Where metal lockers and benches are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" and ICC/ANSI A117.1.
- B. Preinstallation Conference: Conduct conference at Project site.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver master and control keys to Owner by registered mail or overnight package service.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
 1. Warranty Period for Knocked-Down Metal Lockers: Two years from date of Substantial Completion.

2. Warranty Period for All-Welded Metal Lockers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with A60 (ZF180) zinc-iron, alloy (galvannealed) coating designation.
- C. Expanded Metal: ASTM F 1267, Type II (flattened), Class I, 3/4-inch (19-mm) steel mesh, with at least 70 percent open area.
- D. Stainless-Steel Sheet: ASTM A 666, Type 304.
- E. Extruded Aluminum: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated.
- F. Steel Tube: ASTM A 500, cold rolled.
- G. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.
- H. Anchors: Material, type, and size required for secure anchorage to each substrate.
 1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls, and elsewhere as indicated, for corrosion resistance.
 2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.2 ATHLETIC METAL LOCKERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 1. All-Welded, Athletic Metal Lockers:
 - a. Art Metal Products; Box Lockers.
 - b. List Industries Inc.; Classmate Lockers.
 - c. Lyon Workspace Products, LLC; All-Welded Expanded Metal Lockers.
 - d. Penco Products, Inc.; All-Welded Lockers.
 - e. Republic Storage Systems Company; All-Welded Ventilated Lockers.
 2. Knocked-Down, Athletic Metal Lockers:
 - a. Art Metal Products; HDV Lockers.
 - b. ASI Storage Solutions Inc.; Competitor Collection.

- c. General Storage Systems Ltd.; Mod-U-Vent II Ventilated Locker.
 - d. Hadrian Manufacturing Inc.; Gladiator Lockers.
 - e. List Industries Inc.; HDV Lockers.
 - f. Lyon Workspace Products, LLC; Expanded Metal Lockers.
 - g. Penco Products, Inc.; Invincible II Lockers.
 - h. Republic Storage Systems Company; Heavy Duty Ventilated Lockers.
 - i. Shanahan's Manufacturing Limited; Pinnacle Lockers.
- B. Locker Arrangement: Box.
- C. Material: Metallic-coated steel sheet.
- D. Body and Shelves: Assembled by welding or riveting or bolting body components together. Fabricate from unperforated steel sheet with 0.048-inch (1.21-mm) nominal-thickness backs and 0.060-inch (1.52-mm) nominal-thickness tops, bottoms, and shelves.
- E. Unperforated Sides: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet.
- F. Perforated Sides: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet with manufacturer's standard diamond perforations.
- G. Expanded-Metal Sides: Fabricated from 0.090-inch (2.28-mm) nominal-thickness expanded metal; welded to 0.105-inch (2.66-mm) nominal-thickness steel angles or 0.060-inch (1.52-mm) nominal-thickness steel channel frames.
- H. Frames: Channel formed; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet or 0.097-inch (2.45-mm) nominal-thickness steel angles; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral door strike full height on vertical main frames.
- I. Reinforced Bottoms: Structural channels, formed from 0.060-inch (1.52-mm) nominal-thickness steel sheet; welded to front and rear of side-panel frames.
- J. Perforated Doors: One piece; fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet with manufacturer's standard diamond perforations; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges and latch point (bottom) and right-angle single bend at remaining edges for box lockers.
- 1. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; welded to inner face of doors.
- K. Expanded-Metal Doors: Fabricated from 0.090-inch (2.28-mm) nominal-thickness expanded metal; welded to 0.105-inch (2.66-mm) nominal-thickness steel angle frame; with 0.090-inch (2.28-mm) nominal-thickness, steel sheet lock panel backed by 0.060-inch (1.52-mm) nominal-thickness steel sheet retainer welded to door frame.
- L. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.

1. Knuckle Hinges: Steel, full loop, five or seven knuckles, tight pin; minimum 2 inches (51 mm) high. Provide no fewer than three hinges for each door more than 42 inches (1067 mm) high.
 2. Continuous Hinges: Manufacturer's standard, steel; side or top mounted as required by locker configuration.
 3. Hinges: Manufacturer's standard, steel, continuous or knuckle type.
- M. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond face of door; pry and vandal resistant.
1. Multipoint Latching: Finger-lift latch control designed for use with built-in combination locks, built-in cylinder locks, or padlocks; positive automatic latching and prelocking.
 - a. Latch Hooks: Equip doors less than 48 inches (1219 mm) high with two latch hooks; fabricated from 0.120-inch (3.04-mm) nominal-thickness steel sheet; welded to full-height door strikes; with resilient silencer on each latch hook.
 - b. Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact and incorporating a prelocking device that allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.
 2. Single-Point Latching: Nonmoving latch hook designed to engage bolt of built-in combination or cylinder lock.
 - a. Latch Hook: Equip each door with one latch hook, fabricated from 0.120-inch (3.04-mm) nominal-thickness steel sheet; welded midway up full-height door strike; with resilient silencer.
- N. Projecting Turn-Handle and Latch: Steel handle welded to manufacturer's standard, three-point, cremone-type latching mechanism consisting of steel rods or bars that engage main locker frame at top and bottom of door, and center latch that engages strike jamb; with steel padlock loop.
- O. Door Handle and Latch for Box Lockers: Stainless-steel strike plate with integral pull; with steel padlock loop that projects through metal locker door.
- P. Cylinder Locks: Built-in, flush, cam locks with five-pin tumbler keyway, keyed separately and master keyed. Furnish two change keys for each lock and two master keys.
1. Key Type: Grooved, with minimum 2- by 2.68-inch (51- by 68.3-mm) key head for accessible lockers.
- Q. Equipment: Equip each metal locker with identification plate and the following unless otherwise indicated:
1. Single-Tier Units: Shelf, one double-prong ceiling hook, and two single-prong wall hooks.
 2. Double-Tier Units: One double-prong ceiling hook and two single-prong wall hooks.
 3. Triple-Tier Units: One double-prong ceiling hook.
- R. Accessories:

1. Legs: 6 inches (152 mm) high; formed by extending vertical frame members or fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet; welded to bottom of locker.
 - a. Closed Front and End Bases: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
 2. Continuous Zee Base: 4 inches (102 mm) high; fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet.
 3. Continuous Sloping Tops: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet, with a pitch of approximately 20 degrees.
 4. Recess Trim: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
 5. Filler Panels: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
 6. Boxed End Panels: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet.
- S. Finish: powder coat.
1. Color(s): As selected by Architect from manufacturer's full range.

2.3 LOCKER BENCHES

- A. Provide bench units with overall assembly height of 17-1/2 inches (445 mm).
- B. Bench Tops: Manufacturer's standard one-piece units, with rounded corners and edges.
 1. Size: Minimum 9-1/2 inches wide by 1-1/4 inches thick (241 mm wide by 32 mm thick except provide minimum 20-inch- (508-mm-) wide tops where accessible benches are indicated.
 2. Laminated clear hardwood with one coat of clear sealer on all surfaces and one coat of clear lacquer on top and sides.
- C. Freestanding Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top, complete with fasteners, and as follows:
 1. Aluminum: 1/8-inch-thick by 3-inch-wide (3-mm-thick by 76-mm-wide) channel or 1/4-inch-thick by 3-inch-wide (6-mm-thick by 76-mm-wide) bar stock, shaped into inverted-T form; with nonskid pads at bottom.
 - a. Finish: Clear anodic finish.

2.4 FABRICATION

- A. Fabricate metal lockers square, rigid, and without warp and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.
 1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
 2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.

- B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.
- C. All-Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds flush.
- D. Accessible Lockers: Fabricate as follows:
 - 1. Locate bottom shelf no lower than 15 inches (381 mm) above the floor.
 - 2. Where hooks, coat rods, or additional shelves are provided, locate no higher than 48 inches (1219 mm) above the floor.
- E. Hooks: Manufacturer's standard ball-pointed type, aluminum or steel; zinc plated.
- F. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high.
- G. Continuous Base: Formed into channel or zee profile for stiffness and fabricated in lengths as long as practical to enclose base and base ends of metal lockers; finished to match lockers.
- H. Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; finished to match lockers.
 - 1. Sloping-top corner fillers, mitered.
- I. Individual Sloping Tops: Fabricated in width to fit one locker frame in lieu of flat locker tops; with integral back; finished to match lockers. Provide wedge-shaped divider panels between lockers.
- J. Recess Trim: Fabricated with minimum 2-1/2-inch (64-mm) face width and in lengths as long as practical; finished to match lockers.
- K. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.
- L. Boxed End Panels: Fabricated with 1-inch- (25-mm-) wide edge dimension and designed for concealing fasteners and holes at exposed ends of nonrecessed metal lockers; finished to match lockers.
- M. Finished End Panels: Designed for concealing unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of nonrecessed metal lockers; finished to match lockers.
- N. Center Dividers: Full-depth, vertical partitions between bottom and shelf; finished to match lockers.

2.5 STEEL SHEET FINISHES

- A. Baked-Enamel Finish: Immediately after cleaning, pretreating, and phosphatizing, apply manufacturer's standard thermosetting baked-enamel finish. Comply with paint manufacturer's written instructions for application, baking, and minimum dry film thickness.
- B. Powder-Coat Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard, baked-polymer, thermosetting powder finish. Comply with resin manufacturer's written instructions for application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install level, plumb, and true; shim as required, using concealed shims.
 - 1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
 - 2. Anchor single rows of metal lockers to walls near top and bottom of lockers of lockers and to floor.
 - 3. Anchor back-to-back metal lockers to floor.
- B. Knocked-Down Metal Lockers: Assemble with standard fasteners, with no exposed fasteners on door faces or face frames.
- C. All-Welded Metal Lockers: Connect groups together with standard fasteners, with no exposed fasteners on face frames.
- D. Equipment and Accessories: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
 - 1. Attach hooks with at least two fasteners.
 - 2. Attach door locks on doors using security-type fasteners.
 - 3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
 - a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
 - 4. Attach recess trim to recessed metal lockers with concealed clips.
 - 5. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
 - 6. Attach sloping-top units to metal lockers, with closures at exposed ends.
 - 7. Attach boxed end panels with concealed fasteners to conceal exposed ends of nonrecessed metal lockers.
 - 8. Attach finished end panels with fasteners only at perimeter to conceal exposed ends of nonrecessed metal lockers.
- E. Freestanding Locker Benches: Place benches in locations indicated on Drawings.

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END OF SECTION 105113

METAL LOCKERS

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SECTION 10530 - EXTRUDED ALUMINUM WALKWAY COVERS

PART I - GENERAL

.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General, Supplementary, and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. The extent of extruded aluminum walkway covers is shown on the Drawings and as specified herein.
- A. Definition: Extruded aluminum walkway cover shall consist entirely of extruded aluminum sections; roll-formed sections are not acceptable. System shall consist of heli-arc welded, one-piece rigid structural bents for column and beam assemblies, decking, fascia, accessory items and hardware to provide a complete system.
- A. Water shall drain from deck into designated beams and out at grade level of columns through weepholes.

1.3 SUBMITTALS

- A. Shop Drawings: Submit detailed shop drawings. Include layout of walkway cover system, bent locations (identify drain columns and wet bents), all mechanical joint locations with complete details, connections, jointing and accessories. Include details of concrete footings and bent anchorage.
- B. Product Data: Submit manufacturer's product data, specifications, component performance data and installation instructions.
- C. Calculations: Provide signed and sealed structural calculations for the walkway covers, by a professional engineer registered in the State of Florida.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the following except as otherwise indicated:
 - 1. AWS (American Welding Society) standards for structural aluminum welding.

Extruded Aluminum Walkway Covers 10530-1

- B. Installer Qualification: Firm with not less than three (3) years experience in installation of aluminum walkway covers of type, quantity and installation methods similar to work of this section.
- B. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to insure proper fitting of work. However, allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay work.
- B. Shop Assembly: Preassemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Coordination: Coordinate work of this Section with work of other sections which interface with covered walkway system (sidewalks, curbs, building fascias, etc.).

1.5 PERFORMANCE REQUIREMENTS:

- A. System Performance: Provide aluminum covered walkway system that has been designed, produced, fabricated and installed to withstand normal temperature changes as well as live loading, dead loading and wind loading in compliance with Standard Building Code requirements for geographic area in which work is located and as follows:
 - 1. Live Load: 30 p.s.f. minimum.
 - 2. Structural design for wind forces: Comply with ASCE 7.
 - 3. Design Wind Velocity: 110 m.p.h.
 - 4. Importance Factor: 1.1.
 - 5. Stability Criteria: Pursuant to Code.
- B. Sizes shown on Drawings shall be considered minimum.
- C. Structure shall be capable of sustaining severe icing, hail, hurricane force winds and supporting a concentrated load such as being walked upon.

1.6 WARRANTY

- A. Warranty: Manufacturer shall warrant the entire system against defects in labor and materials for a period of five (5) years commencing on the date of Substantial Completion. Defects in labor and material may include but is not limited to, one or more of the following:
 - 2. Moisture leaks.
 - 3. Metal failure including excessive deflection
 - 4. Fastener failure
 - 5. Finish failure

Extruded Aluminum Walkway Covers 10530-2

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: "DITT-Deck Extruded Aluminum Walkway Cover System"; Dittmer Architectural Aluminum.

2.2 MATERIALS

- A. All aluminum extrusions shall be alloy 6063 heat treated to a T-6 temper.
- A. Standard finish for all components shall be satin anodize 204-R1 meeting Aluminum Association Specification AA-M-10C-22A-21.
- A. Fasteners:
 - 2. Deck Screws: Type 18-8 non-magnetic stainless steel sealed with a neoprene "O" ring beneath 5/8" outside dimension, conical washer. Rivets are not permitted.
 - 3. Fascia Rivets: Size 3/16" by 1/2" grip range aluminum rivets with aluminum mandrel.
 - 4. Bolts: All bolts, nuts and washers to be 18-8 non-magnetic stainless steel.
 - 5. Tek Screws: not permitted

2.3 FABRICATION

- A. Comply with indicated profiles, dimensioned requirements and structural requirements.
- B. Use sections true to details with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture, free from defects impairing strength and durability.
- B. All welding do be done by heli-arc process.
- B. Bents shall consist of shop welded one piece units. When size of bents do not permit shipment as a welded unit, concealed mechanical joints may be used.
- B. Mechanical joints shall consist of stainless steel bolts with a minimum of two (2) bolts per fastening. Bolts and nuts shall be installed in a concealed manner utilizing 1/2 inch thick by 1-1/2 inch aluminum bolt bars welded to structural members. All such mechanical joints must be detailed on shop drawings showing all locations.

Extruded Aluminum Walkway Covers 10530-3

- B. Roof Deck: Extruded Aluminum shapes, interlocking self-flashing sections. Shop fabricate to lengths and panels widths required for field assembly. Depth of sections to comply with structural requirements. Provide shop induced camber in deck units with spans greater than 16 feet to offset dead load deflections. Welded dams are to be used at non-draining ends of deck.

- B. Expansion joints, design structure for thermal expansion and contraction. Provide expansion joints as required.

- B. Exposed rivets used to fasten bottom of fascia to deck to have finish to match fascia.

- I. Apply a shop applied dip-coat of clear acrylic enamel to each column end terminating in concrete to insulate from electrolytic reaction. Column ends shall be pierced to "key" grout to bent for maximum uplift protection.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE AND HANDLING:

- A. Deliver, store and handle covered walkway system components as recommended by manufacturer. Handle and store in a manner to avoid deforming members and to avoid excessive stresses.

3.2 EXAMINATION

- A. Examine adjacent work for conditions that would prevent quality installation of system.

- A. Do not proceed until defects are corrected.

3.3 CONCRETE FOOTINGS

- A. Concrete footings are not work of this Section. Refer to Section 03310 "Cast-in-Place Concrete".

- A. Sleeves (extruded polystyrene blockouts) shall be furnished by walkway cover manufacturer and placed by the Contractor.

3.4 FIELD DIMENSIONS

- A. Contractor shall field confirm bent locations, dimensions and elevations shown on shop drawings prior to fabrication.

Extruded Aluminum Walkway Covers 10530-4

3.5 INSTALLATION

- A. Erection: Set roof support frames (bents) into pockets provided in top of footings; set to required elevations, align, plumb and level; and grout in place with 2,000 p.s.i. portland cement grout. Assure that grout fills all voids and "keys" to columns. Fill downspout units with grout to bottom of discharge level. Install aluminum deflectors after grouting. Comply with manufacturer's published instructions. Match to finish and elevation of adjacent sidewalks.
- A. Install roof deck sections, accessories and related flashing in accordance with manufacturer's instructions. Provide roof slope for rain drainage without ponding water. Align and anchor roof deck units to structural support frames.
- A. Assemble all components in a neat, workmanlike manner.

3.6 FLASHING

- A. Flashings: Flashings required between covered walkway system and adjoining structures are not work of this Section. Refer to Section 07610 "Sheet Metal Flashing and Trim".

3.7 CLEANING AND PROTECTION

- A. Damaged Units: Replace roof deck panels and other components of the work which have been damaged or have deteriorated beyond successful minor repair.
- A. Cleaning: Remove protective coverings at time in project construction sequence which will afford greatest protection of work. Clean finished surfaces as recommended by manufacturer. Maintain in a clean condition during construction.
- A. Protection: Advise Contractor of protection and surveillance procedures, as required to ensure that work of this section will be without damage or deterioration at time of Substantial Completion.

END OF SECTION 10530

Extruded Aluminum Walkway Covers 10530-5

SECTION 142100 - ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes electric traction passenger elevators.
- B. See Division 09 Section for finish flooring in elevator cars.

1.2 SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information.
- B. Shop Drawings: Show plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment and signals. Indicate loads imposed on building structure at points of support, and maximum and average power demands.
- C. Samples: For exposed finishes.
- D. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.
- E. Operation and maintenance data.
- F. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with ASME A17.1
- B. Accessibility Requirements: Comply with Section 407, 6th Edition Florida Accessibility Code for Building Construction

1.4 WARRANTY

- A. Special Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair, restore, or replace defective elevator work within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

1.5 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide five years full maintenance service by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Fujitec America, Inc.
 - 2. KONE Inc.
 - 3. Otis Elevator Co.
 - 4. Schindler Elevator Corp.
 - 5. ThyssenKrupp Elevator.
- B. Basis-of-design: Hydro Fit Elevator System by Otis Elevator Company.

2.2 SYSTEMS AND COMPONENTS

- A. General: Provide manufacturer's standard elevator systems, including standard components published by manufacturer as included in standard preengineered elevator systems and as required for complete system.
- B. Elevator Machines: At manufacturer's option, provide either variable-voltage, variable-frequency, ac-type or variable-voltage, dc-type hoisting machines. Provide solid-state power converters.
 - 1. Limit total harmonic distortion of regenerated power to 5 percent per IEEE 519.
 - 2. Provide means for absorbing regenerated power when elevator system is operating on standby power.
- C. Fluid for Oil Buffers: If oil buffers are used, use only fire-resistant hydraulic fluid.
- D. Guides: Provide roller guides or polymer-coated, nonlubricated sliding guides at top and bottom of car and counterweight frames.

2.3 OPERATION SYSTEMS

- A. General: Provide manufacturer's standard microprocessor operation system for each elevator as required to provide type of operation system indicated.
- B. Group Automatic Operation with Demand-Based Dispatching: Provide reprogrammable group automatic system that assigns cars to hall calls based on a dispatching program designed to

minimize passenger waiting time. System automatically adjusts to changes in demand for different traffic conditions including heavy incoming, heavy two-way, heavy outgoing, and light off-hours as variations of normal two-way traffic.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Fujitec America, Inc.; Millennium.
 - b. KONE Inc.; KCM 831.
 - c. Otis Elevator Co.; Elevonic.
 - d. Schindler Elevator Corp.; Miconic TX.
 - e. ThyssenKrupp Elevator; Traflomatic.

C. Single-Car Auxiliary Operations:

1. Standby Power Operation: On activation of standby power, car is returned to a designated floor and parked with doors open. Car can be manually put in service on standby power, either for return operation or for regular operation, by switches in control panel located at main lobby.
2. Battery-Powered Lowering: If power fails and car is at a floor, it remains at that floor, opens its doors, and shuts down. If car is between floors, it is lowered to the next floor below, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.

D. Security Feature: Security feature shall not affect emergency firefighters' service.

2.4 DOOR REOPENING DEVICES

- A. Infrared Array: Provide door reopening devices with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more of the light beams shall cause doors to stop and reopen.
- B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

2.5 FINISH MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel, Type B, pickled.
- C. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.
- D. Stainless-Steel Bars: ASTM A 276, Type 304.
- E. Stainless-Steel Tubing: ASTM A 554, Grade MT 304.
- F. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.

- G. Plastic Laminate: High-pressure type complying with NEMA LD 3, Type HGS or HGL.

2.6 CAR ENCLOSURES

- A. General: Provide steel-framed car enclosures with nonremovable wall panels, with car roof, access doors, power door operators, and ventilation.
1. Provide standard railings complying with ASME A17.1 on car tops where required by ASME A17.1.
 2. Enameled-Steel Wall Panels: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
 3. Stainless-Steel Wall Panels: Flush, hollow-metal construction.
 4. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to manufacturer's standard core with manufacturer's standard protective edge trim. Plastic-laminate color, texture, and pattern as selected by Architect from elevator manufacturer's full range.
 5. Enameled-Steel Doors: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
 6. Stainless-Steel Doors: Flush, hollow-metal construction.
 7. Plastic-Laminate Doors: Flush, hollow-metal construction; fabricated by laminating plastic laminate to exposed faces of enameled cold-rolled steel doors and covering edges with protective edge trim. Plastic-laminate color, texture, and pattern as selected by Architect from elevator manufacturer's full range.
 8. Sills: Extruded aluminum, with grooved surface, 1/4 inch (6.4 mm) thick.
 9. Luminous Ceiling: Fluorescent light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic.

2.7 HOISTWAY ENTRANCES

- A. General: Provide manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories.
1. Where gypsum board wall construction is indicated, provide self-supporting frames with reinforced head sections.
- B. Materials and Fabrication: Provide manufacturer's standards, but not less than the following:
1. Enameled-Steel Frames: Formed from cold-rolled or hot-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
 2. Stainless-Steel Frames: Formed from stainless-steel sheet.
 3. Enameled-Steel Doors: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
 4. Sills: Extruded aluminum, with grooved surface, 1/4 inch (6.4 mm) thick.
 5. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

2.8 SIGNAL EQUIPMENT

- A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with LEDs.
- B. Car Control Stations: Provide manufacturer's standard car control stations. Mount in return panel adjacent to car door, unless otherwise indicated.
- C. Emergency Communication System: Provide system that complies with ASME A17.1 and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)." On activation, system dials preprogrammed number of monitoring station and identifies elevator location to monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring station has responded. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.
- D. Firefighters' Two-Way Telephone Communication Service: Provide telephone jack in each car and required conductors in traveling cable for firefighters' two-way telephone communication service specified in Division 28 Section "Fire Detection and Alarm."
- E. Car Position Indicator: Provide illuminated, digital-type car position indicator, located above car door or above car control station. Also provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served.
 - 1. Include travel direction arrows if not provided in car control station.
- F. Hall Push-Button Stations: Provide hall push-button stations at each landing as indicated.
- G. Hall Lanterns: Units with illuminated arrows.
 - 1. Manufacturer's standard wall-mounted units, for mounting above entrance frames.
 - 2. Units mounted in both jambs of entrance frame.
- H. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
- I. Corridor Call Station Pictograph Signs: Provide signs matching hall push-button stations, with text and graphics as required by authorities having jurisdiction.

2.9 ELEVATORS

- A. Elevator Description:
 - 1. Machine Location: Hoistway; no machine room is provided.
 - 2. Rated Load: 2500 lb (1135 kg).
 - 3. Rated Speed: 200 fpm (1.0 m/s).
 - 4. Car Enclosures:
 - a. Inside Width: 80 inches (2032 mm) from side wall to side wall.

- b. Inside Depth: 51 inches (1295 mm) from back wall to front wall (return panels).
 - c. Inside Height: 88 inches (2235 mm) to underside of ceiling.
 - d. Front Walls (Return Panels): Satin stainless steel, No. 4 finish.
 - e. Car Fixtures: Satin stainless steel, No. 4 finish.
 - f. Side and Rear Wall Panels: Plastic laminate.
 - g. Door Faces (Interior): Enameled steel.
 - h. Handrails: 1/2 by 2 inches (13 by 50 mm) rectangular satin stainless steel, No. 4 finish, at sides and rear of car.
 - i. Floor prepared to receive sheet vinyl (specified in Division 09 Section "Resilient Sheet Flooring").
5. Hoistway Entrances: As follows:
- a. Width: 42 inches (1067 mm).
 - b. Height: 84 inches (2134 mm).
 - c. Type: Single-speed side sliding.
 - d. Fire-Protection Rating: 1 hour.
 - e. Frames at First Floor Satin stainless steel, No. 4 finish.
 - f. Doors at First Floor at Other Floors: Enameled steel.
6. Hall Fixtures at First Floor at Other Floors: Polished Satin stainless steel, No. 4 finish.
7. Additional Requirements:
- a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, No. 4 finish.
 - b. Provide blanket hooks in all cars and one complete set(s) of full-height protective blankets.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts designed to minimize transmission of vibrations to structure and thereby minimize structure-borne noise from elevator system.
- B. Leveling Tolerance: 1/8 inch (3 mm), up or down, regardless of load and direction of travel.
- C. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

3.2 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.

3.3 PROTECTION

- A. Temporary Use: Limit temporary use for construction purposes to one elevator. Comply with the following requirements for each elevator used for construction purposes:
 - 1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.
 - 2. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
 - 3. Engage elevator Installer to provide full maintenance service.
 - 4. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate, adjust, and maintain elevator(s). Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 142100

SECTION 220517 - SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Stack-sleeve fittings.
 - 3. Sleeve-seal systems.
 - 4. Sleeve-seal fittings.
 - 5. Grout.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.
- C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
- D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- F. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.
- G. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

2.2 STACK-SLEEVE FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Smith, Jay R. Mfg. Co.
 2. Zurn Industries, LLC.
- B. Description: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring, bolts, and nuts for membrane flashing.
1. Underdeck Clamp: Clamping ring with setscrews.

2.3 SLEEVE-SEAL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Products & Systems, Inc.
 2. CALPICO, Inc.
 3. GPT; an EnPro Industries company.
 4. Metraflex Company (The).
 5. Proco Products, Inc.
- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 2. Pressure Plates: Carbon steel.
 3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.4 SLEEVE-SEAL FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Products & Systems, Inc.
 2. CALPICO, Inc.
 3. GPT; an EnPro Industries company.
 4. Metraflex Company (The).
 5. Proco Products, Inc.

- B. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall. Unit has plastic or rubber waterstop collar with center opening to match piping OD.

2.5 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
 - 1. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 - 1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
 - 2. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
 - 3. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 079200 "Joint Sealants."
- E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.2 STACK-SLEEVE-FITTING INSTALLATION

- A. Install stack-sleeve fittings in new slabs as slabs are constructed.
 - 1. Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 2. Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing. Comply with requirements for flashing specified in Section 076200 "Sheet Metal Flashing and Trim."
 - 3. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
 - 4. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
 - 5. Using grout, seal the space around outside of stack-sleeve fittings.
- B. Fire-Barrier Penetrations: Maintain indicated fire rating of floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.3 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.4 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

3.5 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
 - 1. Exterior Concrete Walls above Grade:
 - a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
 - b. Piping NPS 6 and Larger: Galvanized-steel-pipe sleeves.
 - 2. Exterior Concrete Walls below Grade:

- a. Piping Smaller Than NPS 6: Galvanized-steel wall sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
 - b. Piping NPS 6 and Larger: Galvanized-steel wall sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
3. Concrete Slabs-on-Grade:
- a. Piping Smaller Than NPS 6: Galvanized-steel wall sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
 - b. Piping NPS 6 and Larger: Galvanized-steel wall sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
4. Interior Partitions:
- a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
 - b. Piping NPS 6 and Larger: Galvanized-steel-sheet sleeves.

END OF SECTION 220517

SECTION 220518 - ESCUTCHEONS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.
 - 2. Floor plates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
- C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.
- D. Split-Casting Brass Type: With polished, chrome-plated finish and with concealed hinge and setscrew.
- E. Split-Plate, Stamped-Steel Type: With chrome-plated finish, concealed hinge, and spring-clip fasteners.

2.2 FLOOR PLATES

- A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
- B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of insulated piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - g. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - h. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - i. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - j. Bare Piping in Equipment Rooms: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - k. Bare Piping in Equipment Rooms: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. New Piping: One-piece, floor-plate type.
 - 2. Existing Piping: Split-casting, floor-plate type.

3.2 FIELD QUALITY CONTROL

- A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 220518

SECTION 220519 - METERS AND GAGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Bimetallic-actuated thermometers.
2. Filled-system thermometers.
3. Liquid-in-glass thermometers.
4. Light-activated thermometers.
5. Thermowells.
6. Dial-type pressure gages.
7. Gage attachments.
8. Test plugs.
9. Test-plug kits.
10. Sight flow indicators.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of meter and gage, from manufacturer.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For meters and gages to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 BIMETALLIC-ACTUATED THERMOMETERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the

following:

1. Ashcroft Inc.
2. Ernst Flow Industries.
3. Marsh Bellofram.
4. Miljoco Corporation.
5. Nanmac Corporation.
6. Noshok.
7. Palmer Wahl Instrumentation Group.
8. REOTEMP Instrument Corporation.
9. Tel-Tru Manufacturing Company.
10. Trerice, H. O. Co.
11. WATTS.
12. Weiss Instruments, Inc.
13. Weksler Glass Thermometer Corp.
14. WIKA Instrument Corporation.
15. Winters Instruments - U.S.

- B. Standard: ASME B40.200.
- C. Case: Liquid-filled and sealed type(s); stainless steel with 5-inch nominal diameter.
- D. Dial: Nonreflective aluminum with permanently etched scale markings and scales in deg F.
- E. Connector Type(s): Union joint, adjustable angle, with unified-inch screw threads.
- F. Connector Size: 1/2 inch, with ASME B1.1 screw threads.
- G. Stem: 0.25 or 0.375 inch in diameter; stainless steel.
- H. Window: Plain glass.
- I. Ring: Stainless steel.
- J. Element: Bimetal coil.
- K. Pointer: Dark-colored metal.
- L. Accuracy: Plus or minus 1 percent of scale range.

2.2 FILLED-SYSTEM THERMOMETERS

A. Direct-Mounted, Metal-Case, Vapor-Actuated Thermometers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ashcroft Inc.
 - b. Marsh Bellofram.
 - c. Miljoco Corporation.

- d. Palmer Wahl Instrumentation Group.
 - e. REOTEMP Instrument Corporation.
 - f. Trerice, H. O. Co.
 - g. Weiss Instruments, Inc.
2. Standard: ASME B40.200.
3. Case: Sealed type, drawn steel; 5-inch nominal diameter.
4. Element: Bourdon tube or other type of pressure element.
5. Movement: Mechanical, with link to pressure element and connection to pointer.
6. Dial: Nonreflective aluminum with permanently etched scale markings graduated in deg F.
7. Pointer: Dark-colored metal.
8. Window: Glass.
9. Ring: Stainless steel.
10. Connector Type(s): Union joint, 360 degrees in horizontal plane, with locking device; with ASME B1.1 screw threads.
11. Thermal System: Liquid-filled bulb in copper-plated steel, aluminum, or brass stem and of length to suit installation.
- a. Design for Thermowell Installation: Bare stem.
12. Accuracy: Plus or minus percent of scale range.

2.3 LIQUID-IN-GLASS THERMOMETERS

A. Metal-Case, Industrial-Style, Liquid-in-Glass Thermometers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. Flo Fab Inc.
 - b. Miljoco Corporation.
 - c. Palmer Wahl Instrumentation Group.
 - d. Tel-Tru Manufacturing Company.
 - e. Trerice, H. O. Co.
 - f. Weiss Instruments, Inc.
 - g. Weksler Glass Thermometer Corp.
 - h. Winters Instruments – U.S.
2. Standard: ASME B40.200.
3. Case: Cast aluminum; 7-inch nominal size unless otherwise indicated.
4. Case Form: Back angle unless otherwise indicated.
5. Tube: Glass with magnifying lens and blue or red organic liquid.
6. Tube Background: Nonreflective aluminum with permanently etched scale markings graduated in deg F.
7. Window: Glass.
8. Stem: Aluminum and of length to suit installation.

- a. Design for Thermowell Installation: Bare stem.
- 9. Connector: 1-1/4 inches, with ASME B1.1 screw threads.
- 10. Accuracy: Plus or minus 1 percent of scale range or one scale division, to a maximum of 1.5 percent of scale range.

2.4 LIGHT-ACTIVATED THERMOMETERS

A. Direct-Mounted, Light-Activated Thermometers:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Flo Fab Inc.
 - b. REOTEMP Instrument Corporation.
 - c. Terice, H. O. Co.
 - d. Weiss Instruments, Inc.
 - e. Weksler Glass Thermometer Corp.
 - f. WIKA Instrument Corporation.
 - g. Winters Instruments - U.S.
- 2. Case: Metal; 7-inch nominal size unless otherwise indicated.
- 3. Scale(s): Deg F.
- 4. Case Form: Adjustable angle.
- 5. Connector: 1-1/4 inches, with ASME B1.1 screw threads.
- 6. Stem: Aluminum and of length to suit installation.
 - a. Design for Thermowell Installation: Bare stem.
- 7. Display: Digital.
- 8. Accuracy: Plus or minus 2 deg F.

2.5 THERMOWELLS

A. Thermowells:

- 1. Standard: ASME B40.200.
- 2. Description: Pressure-tight, socket-type fitting made for insertion into piping tee fitting.
- 3. Material for Use with Copper Tubing: CNR or CUNI.
- 4. Material for Use with Steel Piping: CSA.
- 5. Type: Stepped shank unless straight or tapered shank is indicated.
- 6. External Threads: NPS 1/2, NPS 3/4, or NPS 1, ASME B1.20.1 pipe threads.
- 7. Internal Threads: 1/2, 3/4, and 1 inch, with ASME B1.1 screw threads.
- 8. Bore: Diameter required to match thermometer bulb or stem.
- 9. Insertion Length: Length required to match thermometer bulb or stem.
- 10. Lagging Extension: Include on thermowells for insulated piping and tubing.

11. Bushings: For converting size of thermowell's internal screw thread to size of thermometer connection.

B. Heat-Transfer Medium: Mixture of graphite and glycerin.

2.6 PRESSURE GAGES

A. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Ametek U.S. Gauge.
- b. Ashcroft Inc.
- c. Ernst Flow Industries.
- d. Flo Fab Inc.
- e. Marsh Bellofram.
- f. Miljoco Corporation.
- g. Noshok.
- h. Palmer Wahl Instrumentation Group.
- i. REOTEMP Instrument Corporation.
- j. Tel-Tru Manufacturing Company.
- k. Terice, H. O. Co.
- l. WATTS.
- m. Weiss Instruments, Inc.
- n. Weksler Glass Thermometer Corp.
- o. WIKA Instrument Corporation.
- p. Winters Instruments - U.S.

2. Standard: ASME B40.100.

3. Case: Liquid-filled type(s); cast aluminum or drawn steel; 4-1/2-inch nominal diameter.
4. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.
5. Pressure Connection: Brass, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.
6. Movement: Mechanical, with link to pressure element and connection to pointer.
7. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi and kPa.
8. Pointer: Dark-colored metal.
9. Window: Glass.
10. Ring: Metal.
11. Accuracy: Grade A, plus or minus 1 percent of middle half of scale range.

B. Direct-Mounted, Plastic-Case, Dial-Type Pressure Gages:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Ametek U.S. Gauge.
- b. Ashcroft Inc.
- c. Flo Fab Inc.
- d. Marsh Bellofram.
- e. Miljoco Corporation.
- f. Noshok.
- g. Palmer Wahl Instrumentation Group.
- h. REOTEMP Instrument Corporation.
- i. Tel-Tru Manufacturing Company.
- j. Trerice, H. O. Co.
- k. Weiss Instruments, Inc.
- l. Weksler Glass Thermometer Corp.
- m. WIKA Instrument Corporation.
- n. Winters Instruments - U.S.

2. Standard: ASME B40.100.

3. Case: Sealed type; plastic; 4-1/2-inch nominal diameter.
4. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.
5. Pressure Connection: Brass, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.
6. Movement: Mechanical, with link to pressure element and connection to pointer.
7. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi and kPa.
8. Pointer: Dark-colored metal.
9. Window: Glass.
10. Accuracy: Grade A, plus or minus 1 percent of middle half of scale range.

2.7 GAGE ATTACHMENTS

- A. Snubbers: ASME B40.100, brass; with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and piston or porous-metal-type surge-dampening device. Include extension for use on insulated piping.
- B. Valves: Brass or stainless-steel needle, with NPS 1/4 or NPS 1/2 ASME B1.20.1 pipe threads.

2.8 TEST PLUGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Flow Design, Inc.
2. Miljoco Corporation.
3. Nexus Valve, Inc.
4. Peterson Equipment Co., Inc.
5. Sisco Manufacturing Company, Inc.
6. Trerice, H. O. Co.
7. WATTS.

8. Weiss Instruments, Inc.
9. Weksler Glass Thermometer Corp.

- B. Description: Test-station fitting made for insertion into piping tee fitting.
- C. Body: Brass or stainless steel with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.
- D. Thread Size: NPS 1/4, ASME B1.20.1 pipe thread.
- E. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F.
- F. Core Inserts: EPDM self-sealing rubber.

2.9 TEST-PLUG KITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Flow Design, Inc.
 2. Miljoco Corporation.
 3. Nexus Valve, Inc.
 4. Peterson Equipment Co., Inc.
 5. Sisco Manufacturing Company, Inc.
 6. Trerice, H. O. Co.
 7. WATTS.
 8. Weiss Instruments, Inc.
- B. Furnish one test-plug kit containing one thermometer, one pressure gage and adapter, and carrying case. Thermometer sensing elements, pressure gage, and adapter probes shall be of diameter to fit test plugs and of length to project into piping.
- C. Low-Range Thermometer: Small, bimetallic insertion type with 1- to 2-inch-diameter dial and tapered-end sensing element. Dial range shall be at least 25 to 125 deg F.
- D. High-Range Thermometer: Small, bimetallic insertion type with 1- to 2-inch- diameter dial and tapered-end sensing element. Dial range shall be at least 0 to 220 deg F.
- E. Pressure Gage: Small, Bourdon-tube insertion type with 2- to 3-inch- diameter dial and probe. Dial range shall be at least 0 to 200 psig.
- F. Carrying Case: Metal or plastic, with formed instrument padding.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install thermowells with socket extending to center of pipe and in vertical position in piping tees.

- B. Install thermowells of sizes required to match thermometer connectors. Include bushings if required to match sizes.
- C. Install thermowells with extension on insulated piping.
- D. Fill thermowells with heat-transfer medium.
- E. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.
- F. Install direct-mounted pressure gages in piping tees with pressure gage located on pipe at the most readable position.
- G. Install valve and snubber in piping for each pressure gage for fluids.
- H. Install test plugs in piping tees.
- I. Install thermometers in the following locations:
 - 1. Inlet and outlet of each water heater.
- J. Install pressure gages in the following locations:
 - 1. Building water service entrance into building.
 - 2. Inlet and outlet of each pressure-reducing valve.
 - 3. Suction and discharge of each domestic water pump.

3.2 CONNECTIONS

- A. Install meters and gages adjacent to machines and equipment to allow service and maintenance of meters, gages, machines, and equipment.

3.3 ADJUSTING

- A. Adjust faces of meters and gages to proper angle for best visibility.

3.4 THERMOMETER SCHEDULE

- A. Thermometers at inlet and outlet of each domestic water heater shall be one of the following:
 - 1. Liquid-filled, bimetallic-actuated type.
 - 2. Direct-mounted, metal-case, vapor-actuated type.
 - 3. Industrial-style, liquid-in-glass type.
 - 4. Direct-mounted, light-activated type.
 - 5. Test plug with EPDM self-sealing rubber inserts.
- B. Thermometer stems shall be of length to match thermowell insertion length.

3.5 THERMOMETER SCALE-RANGE SCHEDULE

- A. Scale Range for Domestic Cold-Water Piping: 0 to 150 deg F.
- B. Scale Range for Domestic Hot-Water Piping: 0 to 250 deg F.

3.6 PRESSURE-GAGE SCHEDULE

- A. Pressure gages at discharge of each water service into building shall be one of the following:
 - 1. Liquid-filled, direct-mounted, metal case.
 - 2. Sealed, direct-mounted, plastic case.
 - 3. Test plug with EPDM self-sealing rubber inserts.
- B. Pressure gages at inlet and outlet of each water pressure-reducing valve shall be one of the following:
 - 1. Liquid-filled, direct-mounted, metal case.
 - 2. Sealed, direct-mounted, plastic case.
 - 3. Test plug with EPDM self-sealing rubber inserts.
- C. Pressure gages at suction and discharge of each domestic water pump shall be one of the following:
 - 1. Liquid-filled, direct-mounted, metal case.
 - 2. Sealed, direct-mounted, plastic case.
 - 3. Test plug with EPDM self-sealing rubber inserts.

3.7 PRESSURE-GAGE SCALE-RANGE SCHEDULE

- A. Scale Range for Domestic Water Piping: 0 to 160 psi.

END OF SECTION 220519

SECTION 220523.12 - BALL VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Brass ball valves.
 - 2. Bronze ball valves.
 - 3. Steel ball valves.
 - 4. Iron ball valves.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of valve.
 - 1. Certification that products comply with NSF 61 Annex G.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, and soldered ends.
 - 3. Set ball valves open to minimize exposure of functional surfaces.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.
 - 2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B1.20.1 for threads for threaded end valves.
 - 2. ASME B16.1 for flanges on iron valves.
 - 3. ASME B16.5 for flanges on steel valves.
 - 4. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 5. ASME B16.18 for solder-joint connections.
 - 6. ASME B31.9 for building services piping valves.
- C. NSF Compliance: NSF 61 Annex G for valve materials for potable-water service.
- D. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
- E. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- F. Valve Sizes: Same as upstream piping unless otherwise indicated.
- G. Valve Actuator Types:
 - 1. Gear Actuator: For quarter-turn valves NPS 4 and larger.
 - 2. Handlever: For quarter-turn valves smaller than NPS 4.
- H. Valves in Insulated Piping:
 - 1. Include 2-inch stem extensions.
 - 2. Extended operating handles of nonthermal-conductive material and protective sleeves that allow operation of valves without breaking vapor seals or disturbing insulation.
 - 3. Memory stops that are fully adjustable after insulation is applied.

2.2 BRASS BALL VALVES

- A. One-Piece, Brass Ball Valves:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. KITZ Corporation.
 - 2. Description:
 - a. Standard: MSS SP-110.

- b. CWP Rating: 400 psig.
- c. Body Design: One piece.
- d. Body Material: Forged brass or bronze.
- e. Ends: Threaded and soldered.
- f. Seats: PTFE.
- g. Stem: Brass or stainless steel.
- h. Ball: Chrome-plated brass or stainless steel.
- i. Port: Reduced.

B. Two-Piece, Brass Ball Valves with Full Port and Stainless-Steel Trim:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. Hammond Valve.
 - c. Jomar Valve.
 - d. KITZ Corporation.
 - e. Marwin Valve; Richards Industries.
 - f. Milwaukee Valve Company.
 - g. NIBCO INC.
- 2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Two piece.
 - d. Body Material: Forged brass.
 - e. Ends: Threaded and soldered.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

C. Two-Piece, Brass Ball Valves with Regular Port and Stainless-Steel Trim:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Jamesbury; Metso.
- 2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Two piece.
 - d. Body Material: Brass or bronze.
 - e. Ends: Threaded and soldered.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.

- i. Port: Regular.

D. Three-Piece, Brass Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Marwin Valve; Richards Industries.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Three piece.
 - d. Body Material: Forged brass.
 - e. Ends: Threaded and soldered.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

2.3 BRONZE BALL VALVES

A. One-Piece, Bronze Ball Valves with Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. NIBCO INC.
 - c. WATTS.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: One piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Reduced.

B. Two-Piece, Bronze Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Apollo Flow Controls; Conbraco Industries, Inc.
- b. Crane; a Crane brand.
- c. FNW; Ferguson Enterprises, Inc.
- d. Hammond Valve.
- e. Lance Valves.
- f. Milwaukee Valve Company.
- g. NIBCO INC.
- h. WATTS.

2. Description:

- a. Standard: MSS SP-110.
- b. CWP Rating: 600 psig.
- c. Body Design: Two piece.
- d. Body Material: Bronze.
- e. Ends: Threaded or soldered.
- f. Seats: PTFE.
- g. Stem: Stainless steel.
- h. Ball: Stainless steel, vented.
- i. Port: Full.

C. Two-Piece, Bronze Ball Valves with Regular Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Apollo Flow Controls; Conbraco Industries, Inc.
- b. Hammond Valve.
- c. NIBCO INC.
- d. Stockham; a Crane brand.
- e. WATTS.

2. Description:

- a. Standard: MSS SP-110.
- b. CWP Rating: 600 psig.
- c. Body Design: Two piece.
- d. Body Material: Bronze.
- e. Ends: Threaded.
- f. Seats: PTFE.
- g. Stem: Stainless steel.
- h. Ball: Stainless steel, vented.
- i. Port: Regular.

D. Three-Piece, Bronze Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. Hammond Valve.
 - c. Milwaukee Valve Company.
 - d. NIBCO INC.
 - e. WATTS.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Three piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

2.4 STEEL BALL VALVES

A. Class 150, Steel Ball Valves with Full Port:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. FNW; Ferguson Enterprises, Inc.
 - c. Jamesbury; Metso.
 - d. NIBCO INC.
2. Description:
 - a. Standard: MSS SP-72.
 - b. CWP Rating: 285 psig.
 - c. Body Design: Split body.
 - d. Body Material: Carbon steel, ASTM A 216, Type WCB.
 - e. Ends: Flanged or threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

2.5 IRON BALL VALVES

A. Class 125, Iron Ball Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Valve, Inc.
 - b. Apollo Flow Controls; Conbraco Industries, Inc.
 - c. KITZ Corporation.
 - d. Sure Flow Equipment Inc.
 - e. WATTS.
 - f. Zurn Industries, LLC.
2. Description:
 - a. Standard: MSS SP-72.
 - b. CWP Rating: 200 psig.
 - c. Body Design: Split body.
 - d. Body Material: ASTM A 126, gray iron.
 - e. Ends: Flanged or threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel.
 - i. Port: Full.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.

- D. Install valves in position to allow full stem movement.
- E. Install valve tags. Comply with requirements in Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

3.3 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valves with specified CWP ratings are unavailable, the same types of valves with higher CWP ratings may be substituted.
- B. Select valves with the following end connections:
 - 1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 - 2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 3. For Copper Tubing, NPS 5 and Larger: Flanged ends.
 - 4. For Steel Piping, NPS 2 and Smaller: Threaded ends.
 - 5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 6. For Steel Piping, NPS 5 and Larger: Flanged ends.

3.4 DOMESTIC HOT- AND COLD-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller:
 - 1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
 - 2. One piece, brass ball valve.
 - 3. One piece, bronze ball valve with stainless-steel trim.
 - 4. Two-piece, brass ball valves with full or regular port and stainless-steel trim.
 - 5. Two-piece, bronze ball valves with full port and stainless-steel trim.
 - 6. Three-piece, brass ball valves with full port and stainless-steel trim.
 - 7. Three-piece, bronze ball valves with full port and stainless-steel trim.
 - 8. Two-piece, bronze ball valves with regular port and stainless-steel trim.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. Steel and Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
 - 2. Class 150, steel ball valves with full port.
 - 3. Class 150, iron ball valves.

END OF SECTION 220523.12

SECTION 220523.14 - CHECK VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Bronze swing check valves.
 - 2. Iron swing check valves.
 - 3. Iron swing check valves with closure control.
 - 4. Iron, grooved-end swing check valves.
 - 5. Iron, center-guided check valves.
 - 6. Iron, plate-type check valves.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene-diene terpolymer rubber.
- C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of valve.
 - 1. Certification that products comply with NSF 61 Annex G.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, grooves, and weld ends.
 - 3. Set check valves in either closed or open position.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.

2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 1. ASME B1.20.1 for threads for threaded end valves.
 2. ASME B16.1 for flanges on iron valves.
 3. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 4. ASME B16.18 for solder joint.
 5. ASME B31.9 for building services piping valves.
- C. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.
- D. NSF Compliance: NSF 61 Annex G for valve materials for potable-water service.
- E. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
- F. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- G. Valve Sizes: Same as upstream piping unless otherwise indicated.
- H. Valve Bypass and Drain Connections: MSS SP-45.

2.2 BRONZE SWING CHECK VALVES

- A. Class 125, Bronze, Swing Check Valves with Bronze Disc:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Valve, Inc.
 - b. Apollo Flow Controls; Conbraco Industries, Inc.
 - c. Crane; a Crane brand.
 - d. Hammond Valve.
 - e. Jenkins Valves; a Crane brand.
 - f. KITZ Corporation.
 - g. Macomb Groups (The).

- h. Milwaukee Valve Company.
- i. NIBCO INC.
- j. Powell Valves.
- k. Red-White Valve Corp.
- l. Stockham; a Crane brand.
- m. WATTS.

2. Description:

- a. Standard: MSS SP-80, Type 3.
- b. CWP Rating: 200 psig.
- c. Body Design: Horizontal flow.
- d. Body Material: ASTM B 62, bronze.
- e. Ends: Threaded or soldered. See valve schedule articles.
- f. Disc: Bronze.

B. Class 150, Bronze Swing Check Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Crane; a Crane brand.
- b. FNW; Ferguson Enterprises, Inc.
- c. Hammond Valve.
- d. Jenkins Valves; a Crane brand.
- e. Milwaukee Valve Company.
- f. NIBCO INC.
- g. WATTS.

2. Description:

- a. Standard: MSS SP-80, Type 4.
- b. CWP Rating: 300 psig.
- c. Body Design: Horizontal flow.
- d. Body Material: ASTM B 62, bronze.
- e. Ends: Threaded or soldered. See valve schedule articles.
- f. Disc: PTFE.

2.3 IRON SWING CHECK VALVES

A. Class 125, Iron Swing Check Valves with Metal Seats:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Apollo Flow Controls; Conbraco Industries, Inc.
- b. Crane; a Crane brand.
- c. FNW; Ferguson Enterprises, Inc.
- d. Hammond Valve.
- e. Jenkins Valves; a Crane brand.

- f. KITZ Corporation.
- g. Legend Valve & Fitting, Inc.
- h. Macomb Groups (The).
- i. Milwaukee Valve Company.
- j. NIBCO INC.
- k. Powell Valves.
- l. Red-White Valve Corp.
- m. Stockham; a Crane brand.
- n. Sure Flow Equipment Inc.
- o. WATTS.

2. Description:

- a. Standard: MSS SP-71, Type I.
- b. CWP Rating: 200 psig.
- c. Body Design: Clear or full waterway.
- d. Body Material: ASTM A 126, gray iron with bolted bonnet.
- e. Ends: Flanged or threaded. See valve schedule articles.
- f. Trim: Bronze.
- g. Gasket: Asbestos free.

2.4 IRON SWING CHECK VALVES WITH CLOSURE CONTROL

A. Class 125, Iron Swing Check Valves with Lever- and Spring-Closure Control:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Crane; a Crane brand.
- b. Hammond Valve.
- c. Jenkins Valves; a Crane brand.
- d. Milwaukee Valve Company.
- e. NIBCO INC.
- f. Stockham; a Crane brand.
- g. WATTS.

2. Description:

- a. Standard: MSS SP-71, Type I.
- b. CWP Rating: 200 psig.
- c. Body Design: Clear or full waterway.
- d. Body Material: ASTM A 126, gray iron with bolted bonnet.
- e. Ends: Flanged or threaded. See valve schedule articles.
- f. Trim: Bronze.
- g. Gasket: Asbestos free.
- h. Closure Control: Factory-installed exterior lever and weight.

2.5 IRON, GROOVED-END SWING CHECK VALVES

A. 300 CWP, Iron, Grooved-End Swing Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. Shurjoint-Apollo Piping Products USA Inc.
 - c. Tyco by Johnson Controls Company.
 - d. Victaulic Company.
2. Description:
 - a. CWP Rating: 300 psig.
 - b. Body Material: ASTM A 536, ductile iron.
 - c. Seal: EPDM.
 - d. Disc: Spring operated, ductile iron or stainless steel.

2.6 IRON, CENTER-GUIDED, SPRING-LOADED CHECK VALVES

A. Class 125, Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. APCO Willamette Valve and Primer Corporation.
 - c. Crispin Valve.
 - d. DFT Inc.
 - e. Flo Fab Inc.
 - f. FNW; Ferguson Enterprises, Inc.
 - g. GA Industries, Inc.
 - h. Hammond Valve.
 - i. Metraflex Company (The).
 - j. Milwaukee Valve Company.
 - k. Mueller Steam Specialty; A WATTS Brand.
 - l. NIBCO INC.
 - m. Spence Strainers International.
 - n. Sure Flow Equipment Inc.
 - o. Val-Matic Valve & Manufacturing Corp.
 - p. WATTS.
2. Description:
 - a. Standard: MSS SP-125.
 - b. CWP Rating: 200 psig.
 - c. Body Material: ASTM A 126, gray iron.
 - d. Style: Compact wafer, spring loaded.
 - e. Seat: Bronze.

B. Class 125, Iron, Globe, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. DFT Inc.
 - d. Flomatic Corporation.
 - e. Hammond Valve.
 - f. Metraflex Company (The).
 - g. Milwaukee Valve Company.
 - h. Mueller Steam Specialty; A WATTS Brand.
 - i. NIBCO INC.
 - j. Spence Strainers International.
 - k. Sure Flow Equipment Inc.
 - l. Val-Matic Valve & Manufacturing Corp.
 - m. WATTS.
2. Description:
 - a. Standard: MSS SP-125.
 - b. CWP Rating: 200 psig.
 - c. Body Material: ASTM A 126, gray iron.
 - d. Style: Globe, spring loaded.
 - e. Ends: Flanged.
 - f. Seat: Bronze.

C. Class 125, Iron, Compact-Wafer, Center-Guided Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Apollo Flow Controls; Conbraco Industries, Inc.
 - c. Crispin Valve.
 - d. DFT Inc.
 - e. Flo Fab Inc.
 - f. Hammond Valve.
 - g. Milwaukee Valve Company.
 - h. NIBCO INC.
 - i. Spence Strainers International.
 - j. Sure Flow Equipment Inc.
 - k. Val-Matic Valve & Manufacturing Corp.
2. Description:
 - a. Standard: MSS SP-125.
 - b. CWP Rating: 200 psig.
 - c. Body Material: ASTM A 126, gray iron.
 - d. Style: Compact wafer, spring loaded.

- e. Seat: EPDM.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.
- E. Install check valves for proper direction of flow and as follows:
 - 1. Swing Check Valves: In horizontal position with hinge pin level.
 - 2. Center-Guided and Plate-Type Check Valves: In horizontal or vertical position, between flanges.
 - 3. Lift Check Valves: With stem upright and plumb.
- F. Install valve tags. Comply with requirements in Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

3.3 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valve applications are not indicated, use the following:
 - 1. Pump-Discharge Check Valves:
 - a. NPS 2 and Smaller: Bronze swing check valves with bronze or nonmetallic disc.
 - b. NPS 2-1/2 and Larger for Domestic Water: Iron swing check valves with lever and weight or spring; or iron, center-guided, metal-seat or resilient-seat check valves.
 - c. NPS 2-1/2 and Larger for Sanitary Waste and Storm Drainage: Iron swing check valves with lever and weight or spring.
- B. If valves with specified CWP ratings are unavailable, the same types of valves with higher CWP ratings may be substituted.
- C. End Connections:
 - 1. For Copper Tubing, NPS 2 and Smaller: Threaded or soldered.
 - 2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged or threaded.
 - 3. For Copper Tubing, NPS 5 and Larger: Flanged.
 - 4. For Steel Piping, NPS 2 and Smaller: Threaded.
 - 5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged or threaded.
 - 6. For Steel Piping, NPS 5 and Larger: Flanged.
 - 7. For Grooved-End Copper Tubing and Steel Piping: Grooved.

3.5 DOMESTIC HOT- AND COLD-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller: Bronze swing check valves, Class 150, bronze disc with soldered or threaded end connections.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. Iron swing check valves, Class 125, metal seats with threaded or flanged end connections.
 - 2. Iron swing check valves with closure control, Class 125, lever and spring with threaded or flanged end connections.
 - 3. Iron, grooved-end swing check valves, 300 CWP.
 - 4. Iron, center-guided check valves, Class 125, compact wafer.
 - 5. Iron, center-guided check valves, Class 125, metal seat with threaded or flanged end connections.

END OF SECTION 220523.14

SECTION 220529 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Fiberglass pipe hangers.
4. Metal framing systems.
5. Fiberglass strut systems.
6. Thermal-hanger shield inserts.
7. Fastener systems.
8. Pipe stands.
9. Pipe positioning systems.
10. Equipment supports.

- B. Related Sections:

1. Section 055000 "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
2. Section 220516 "Expansion Fittings and Loops for Plumbing Piping" for pipe guides and anchors.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
3. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following; include Product Data for components:
 1. Trapeze pipe hangers.
 2. Metal framing systems.
 3. Fiberglass strut systems.
 4. Pipe stands.
 5. Equipment supports.
- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Detail fabrication and assembly of trapeze hangers.
 2. Design Calculations: Calculate requirements for designing trapeze hangers.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.7 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.

3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

B. Stainless-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.

2.2 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 FIBERGLASS PIPE HANGERS

A. Clevis-Type, Fiberglass Pipe Hangers:

1. Description: Similar to MSS SP-58, Type 1, steel pipe hanger except hanger is made of fiberglass or fiberglass-reinforced resin.
2. Hanger Rods: Continuous-thread rod, washer, and nuts made of stainless steel.

B. Strap-Type, Fiberglass Pipe Hangers:

1. Description: Similar to MSS SP-58, Type 9 or Type 10, steel pipe hanger except hanger is made of fiberglass-reinforced resin.
2. Hanger Rod and Fittings: Continuous-thread rod, washer, and nuts made of stainless steel.

2.4 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. B-line and Eaton business.
 - b. Flex-Strut Inc.
 - c. G-Strut.

- d. Haydon Corporation.
 - e. Thomas & Betts Corporation; A Member of the ABB Group.
 - f. Unistrut; Part of Atkore International.
 - g. Wesanco, Inc.
- 2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
 - 3. Standard: MFMA-4.
 - 4. Channels: Continuous slotted steel channel with inturned lips.
 - 5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
 - 6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
 - 7. Metallic Coating: Hot-dipped galvanized.
 - 8. Paint Coating: Epoxy.
 - 9. Plastic Coating: Epoxy.

B. Non-MFMA Manufacturer Metal Framing Systems:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. CADDY; a brand of nVent.
 - c. Carpenter & Paterson, Inc.
 - d. Empire Industries, Inc.
 - e. FNW; Ferguson Enterprises, Inc.
 - f. Gripple Inc.
 - g. MIRO Industries.
 - h. PHD Manufacturing, Inc.
 - i. Sioux Chief Manufacturing Company, Inc.
- 2. Description: Shop- or field-fabricated pipe-support assembly made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
- 3. Standard: Comply with MFMA-4.
- 4. Channels: Continuous slotted steel channel with inturned lips.
- 5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
- 6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
- 7. Coating: Paint.

2.5 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

- B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.6 PIPE STANDS

- A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
- B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
- C. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.
- D. High-Type, Single-Pipe Stand:
 - 1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
 - 2. Base: Stainless steel.
 - 3. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous-thread rods.
 - 4. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless-steel, roller-type pipe support.
- E. High-Type, Multiple-Pipe Stand:
 - 1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
 - 2. Bases: One or more; plastic.
 - 3. Vertical Members: Two or more protective-coated-steel channels.
 - 4. Horizontal Member: Protective-coated-steel channel.
 - 5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.
- F. Curb-Mounting-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.7 PIPE POSITIONING SYSTEMS

- A. Description: IAPMO PS 42, positioning system of metal brackets, clips, and straps for positioning piping in pipe spaces; for plumbing fixtures in commercial applications.

2.8 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.9 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 - 2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Fiberglass Pipe-Hanger Installation: Comply with applicable portions of MSS SP-69 and MSS SP-89. Install hangers and attachments as required to properly support piping from building structure.
- D. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.
- E. Fiberglass Strut System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled fiberglass struts.
- F. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- G. Fastener System Installation:
 - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- H. Pipe Stand Installation:

1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
 2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. See Section 077200 "Roof Accessories" for curbs.
- I. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture.
 - J. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
 - K. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
 - L. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
 - M. Install lateral bracing with pipe hangers and supports to prevent swaying.
 - N. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
 - O. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
 - P. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
 - Q. Insulated Piping:
 1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.

- a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
- 4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
 - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
 - e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
- 5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
- 6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Section 099123 "Interior Painting."
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports, metal trapeze pipe hangers, and metal framing systems and attachments for general service applications.
- F. Use stainless-steel pipe hangers and fiberglass pipe hangers and stainless-steel or corrosion-resistant attachments for hostile environment applications.
- G. Use copper-plated pipe hangers and copper or stainless-steel attachments for copper piping and tubing.
- H. Use padded hangers for piping that is subject to scratching.
- I. Use thermal-hanger shield inserts for insulated piping and tubing.
- J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
 - 2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.
 - 3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.

4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
 5. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
 6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.
 7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 8. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 10. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
 11. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
 12. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
 13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
 14. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
 15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
 16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.
 17. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
 18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2-1/2 to NPS 24, from single rod if horizontal movement caused by expansion and contraction might occur.
 19. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
 20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
 21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.
- K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- M. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 6. C-Clamps (MSS Type 23): For structural shapes.
 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- N. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

- O. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
 2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
 3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
 4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
 5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
 6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
 7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
 8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
 - a. Horizontal (MSS Type 54): Mounted horizontally.
 - b. Vertical (MSS Type 55): Mounted vertically.
 - c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.
- P. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- Q. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- R. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.
- S. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION 220529

SECTION 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment labels.
 - 2. Warning signs and labels.
 - 3. Pipe labels.
 - 4. Stencils.
 - 5. Valve tags.
 - 6. Warning tags.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve numbering scheme.
- E. Valve Schedules: For each piping system to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Brimar Industries, Inc.

- c. Carlton Industries, LP.
 - d. Champion America.
 - e. Craftmark Pipe Markers.
 - f. emedco.
 - g. Kolbi Pipe Marker Co.
 - h. LEM Products Inc.
 - i. Marking Services, Inc.
 - j. Seton Identification Products.
2. Material and Thickness: Brass, 0.032-inch stainless steel, 0.025-inch aluminum, 0.032-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 3. Letter Color: White.
 4. Background Color: Black.
 5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
 7. Fasteners: Stainless-steel self-tapping screws.
 8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Brimar Industries, Inc.
 - c. Carlton Industries, LP.
 - d. Champion America.
 - e. Craftmark Pipe Markers.
 - f. emedco.
 - g. Kolbi Pipe Marker Co.
 - h. LEM Products Inc.
 - i. Marking Services, Inc.
 - j. Seton Identification Products.
2. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
3. Letter Color: White.
4. Background Color: Black.
5. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
6. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
7. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
8. Fasteners: Stainless-steel rivets or self-tapping screws.

9. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.
- D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number, and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.
 4. Champion America.
 5. Craftmark Pipe Markers.
 6. emedco.
 7. LEM Products Inc.
 8. Marking Services, Inc.
 9. National Marker Company.
 10. Seton Identification Products.
 11. Stranco, Inc.
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- C. Letter Color: White.
- D. Background Color: Black.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- H. Fasteners: Stainless-steel rivets or self-tapping screws.
- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- J. Label Content: Include caution and warning information plus emergency notification instructions.

2.3 PIPE LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Actioncraft Products, Inc.; a division of Industrial Test Equipment Co, Inc.
 2. Brady Corporation.
 3. Brimar Industries, Inc.
 4. Carlton Industries, LP.
 5. Champion America.
 6. Craftmark Pipe Markers.
 7. emedco.
 8. Kolbi Pipe Marker Co.
 9. LEM Products Inc.
 10. Marking Services, Inc.
 11. Seton Identification Products.
- B. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- C. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- D. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- E. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.
1. Flow-Direction Arrows: Integral with piping-system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
 2. Lettering Size: Size letters according to ASME A13.1 for piping at least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances.

2.4 STENCILS

- A. Stencils for Piping:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brimar Industries, Inc.
 - b. Carlton Industries, LP.
 - c. Champion America.
 - d. Craftmark Pipe Markers.
 - e. Kolbi Pipe Marker Co.
 - f. Marking Services, Inc.

2. Lettering Size: Size letters according to ASME A13.1 for piping at least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances.
3. Stencil Material: Fiberboard or metal.
4. Stencil Paint: Exterior, gloss, acrylic enamel in colors complying with recommendations in ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.
5. Identification Paint: Exterior, acrylic enamel in colors according to ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.

2.5 VALVE TAGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Actioncraft Products, Inc.; a division of Industrial Test Equipment Co, Inc.
 2. Brady Corporation.
 3. Brimar Industries, Inc.
 4. Carlton Industries, LP.
 5. Champion America.
 6. Craftmark Pipe Markers.
 7. emedco.
 8. Kolbi Pipe Marker Co.
 9. LEM Products Inc.
 10. Marking Services, Inc.
 11. Seton Identification Products.
- B. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
1. Tag Material: Brass, 0.032-inch stainless steel, 0.025-inch aluminum, 0.032-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 2. Fasteners: Brass wire-link chain or beaded chain or S-hook.
- C. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
1. Valve-tag schedule shall be included in operation and maintenance data.

2.6 WARNING TAGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.

4. Champion America.
5. Craftmark Pipe Markers.
6. emedco.
7. Kolbi Pipe Marker Co.
8. LEM Products Inc.
9. Marking Services, Inc.
10. Seton Identification Products.

- A. Description: Preprinted or partially preprinted accident-prevention tags of plasticized card stock with matte finish suitable for writing.
1. Size: 3 by 5-1/4 inches minimum approximately 4 by 7 inches.
 2. Fasteners: Brass grommet and wire or reinforced grommet and wire or string.
 3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
 4. Color: Safety yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

3.3 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.4 PIPE LABEL INSTALLATION

- A. Piping Color Coding: Painting of piping is specified in Section 099123 "Interior Painting."
- B. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, with painted, color-coded bands or rectangles on each piping system.

1. Identification Paint: Use for contrasting background.
 2. Stencil Paint: Use for pipe marking.
- C. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
1. Near each valve and control device.
 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 5. Near major equipment items and other points of origination and termination.
 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- D. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.
- E. Pipe Label Color Schedule:
1. Domestic Water Piping
 - a. Background: Safety green.
 - b. Letter Colors: White.
 2. Sanitary Waste Piping:
 - a. Background Color: Safety purple.
 - b. Letter Color: White.

3.5 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
1. Valve-Tag Size and Shape:
 - a. Cold Water: 1-1/2 inches, round.
 - b. Hot Water: 1-1/2 inches, round.
 2. Valve-Tag Colors:
 - a. Cold Water: Safety green.

b. Hot Water: Safety green.

3. Letter Colors:

a. Cold Water: White

b. Hot Water: White.

3.6 WARNING-TAG INSTALLATION

A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 220553

SECTION 220719 - PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes insulating the following plumbing piping services:
 - 1. Domestic cold-water piping.
 - 2. Domestic hot-water piping.
 - 3. Domestic recirculating hot-water piping.
 - 4. Roof drains and rainwater leaders.
 - 5. Supplies and drains for handicap-accessible lavatories and sinks.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied, if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
 - 2. Detail insulation application at pipe expansion joints for each type of insulation.
 - 3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
 - 4. Detail removable insulation at piping specialties, equipment connections, and access panels.
 - 5. Detail application of field-applied jackets.
 - 6. Detail application at linkages of control devices.
- C. Samples: For each type of insulation and jacket indicated. Identify each Sample, describing product and intended use. Sample sizes are as follows:
 - 1. Preformed Pipe Insulation Materials: 12 inches long by NPS 2.
 - 2. Jacket Materials for Pipe: 12 inches long by NPS 2.
 - 3. Sheet Jacket Materials: 12 inches square.
 - 4. Manufacturer's Color Charts: For products where color is specified, show the full range of colors available for each type of finish material.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.
- C. Comply with the following applicable standards and other requirements specified for miscellaneous components:
 - 1. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.8 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Pittsburgh Corning Corporation.
 - 2. Block Insulation: ASTM C 552, Type I.
 - 3. Special-Shaped Insulation: ASTM C 552, Type III.
 - 4. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.
 - 5. Preformed Pipe Insulation with Factory-Applied ASJ: Comply with ASTM C 552, Type II, Class 2.
 - 6. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.
- G. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. K-Flex USA.
- H. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. Johns Manville; a Berkshire Hathaway Company.
 - c. Knauf Insulation.
 - d. Manson Insulation Inc.
 - e. Owens Corning.
- I. Mineral-Fiber, Preformed Pipe Insulation:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Johns Manville; a Berkshire Hathaway Company.
 - b. Knauf Insulation.
 - c. Manson Insulation Inc.
 - d. Owens Corning.

Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
- J. Phenolic:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. Resolco, Inc.
 2. Preformed pipe insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type III, Grade 1.
 3. Block insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type II, Grade 1.
 4. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.

5. Factory-Applied Jacket: Requirements are specified in "Factory-Applied Jackets" Article.
- K. Polyolefin: Unicellular, polyethylene thermal plastic insulation. Comply with ASTM C 534 or ASTM C 1427, Type I, Grade 1 for tubular materials.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Armacell LLC.

2.2 INSULATING CEMENTS

- A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Ramco Insulation, Inc.
- B. Expanded or Exfoliated Vermiculite Insulating Cement: Comply with ASTM C 196.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Ramco Insulation, Inc.
- C. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Ramco Insulation, Inc.

2.3 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
- B. Cellular-Glass Adhesive: Two-component, thermosetting urethane adhesive containing no flammable solvents, with a service temperature range of minus 100 to plus 200 deg F.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Foster Brand; H.B. Fuller Construction Products.

2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. K-Flex USA.
 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Phenolic Adhesive: Solvent-based resin adhesive, with a service temperature range of minus 75 to plus 300 deg F.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

F. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

G. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Dow Consumer Solutions.
 - b. Johns Manville; a Berkshire Hathaway company.
 - c. P.I.C. Plastics, Inc.
 - d. Speedline Corporation.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

- a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Knauf Insulation.
 - d. Vimasco Corporation.
 2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 5. Color: White.
- C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below-ambient services.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
 2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
 3. Service Temperature Range: 0 to 180 deg F.
 4. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
 5. Color: White.
- D. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Knauf Insulation.
 - d. Mon-Eco Industries, Inc.
 - e. Vimasco Corporation.
 2. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 4. Solids Content: 60 percent by volume and 66 percent by weight.
 5. Color: White.

2.5 LAGGING ADHESIVES

- A. Description: Comply with MIL-A-3316C, Class I, Grade A, and shall be compatible with insulation materials, jackets, and substrates.

1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Vimasco Corporation.
3. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over pipe insulation.
4. Service Temperature Range: 0 to plus 180 deg F.
5. Color: White.

2.6 SEALANTS

A. Joint Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
 - d. Pittsburgh Corning Corporation.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Permanently flexible, elastomeric sealant.
4. Service Temperature Range: Minus 100 to plus 300 deg F.
5. Color: White or gray.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. FSK and Metal Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.

5. Color: Aluminum.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.7 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
 2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
 3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.8 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

- a. Johns Manville; a Berkshire Hathaway company.
 - b. P.I.C. Plastics, Inc.
 - c. Proto Corporation.
 - d. Speedline Corporation.
2. Adhesive: As recommended by jacket material manufacturer.
 3. Color: Color as selected by Architect.
 4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
 - a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

2.9 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

- B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
2. Width: 3 inches.

3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Ideal Tape Co., Inc., an American Biltrite Company.
2. Width: 2 inches.
3. Thickness: 6 mils.
4. Adhesion: 64 ounces force/inch in width.
5. Elongation: 500 percent.
6. Tensile Strength: 18 lbf/inch in width.

D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
2. Width: 2 inches.
3. Thickness: 3.7 mils.
4. Adhesion: 100 ounces force/inch in width.
5. Elongation: 5 percent.
6. Tensile Strength: 34 lbf/inch in width.

2.10 SECUREMENTS

A. Bands:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. RPR Products, Inc.

1. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304; 0.015 inch thick, 1/2 inch wide with wing seal or closed seal.
 2. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing seal or closed seal.
- B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.
- C. Wire: 0.062-inch soft-annealed, galvanized steel.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. C & F Wire.

2.11 PROTECTIVE SHIELDING GUARDS

- A. Protective Shielding Pipe Covers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Buckaroos, Inc.
 - b. Just Manufacturing.
 - c. McGuire Manufacturing.
 - d. MVG Molded Products.
 - e. Plumberex Specialty Products, Inc.
 - f. Truebro.
 - g. Zurn Industries, LLC.
 2. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.
- B. Protective Shielding Piping Enclosures:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Truebro.
 - b. Zurn Industries, LLC.
 2. Description: Manufactured plastic enclosure for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with ADA requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 - 1. Verify that systems to be insulated have been tested and are free of defects.
 - 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
 - 1. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
- C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
 - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
 - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
 - a. For below-ambient services, apply vapor-barrier mastic over staples.
 - 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above-ambient services, do not install insulation to the following:

1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Cleanouts.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.

1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:

1. Pipe: Install insulation continuously through floor penetrations.

2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
 1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
 3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
 5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
 6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
 7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
 8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
 9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation

at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

- D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
 2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
 3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
 4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
 5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF CELLULAR-GLASS INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient services, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of cellular-glass block insulation of same thickness as pipe insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When preformed sections of insulation are not available, install mitered sections of cellular-glass insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of cellular-glass insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.

3.7 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.8 INSTALLATION OF MINERAL-FIBER INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.9 INSTALLATION OF PHENOLIC INSULATION

A. General Installation Requirements:

1. Secure single-layer insulation with stainless-steel bands at 12-inch intervals and tighten bands without deforming insulation materials.

2. Install 2-layer insulation with joints tightly butted and staggered at least 3 inches. Secure inner layer with 0.062-inch wire spaced at 12-inch intervals. Secure outer layer with stainless-steel bands at 12-inch intervals.

B. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient services, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets with vapor retarders on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

C. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of block insulation of same material and thickness as pipe insulation.

D. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed insulation sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.

E. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed insulation sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.

3.10 INSTALLATION OF POLYOLEFIN INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Seal split-tube longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of polyolefin sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of polyolefin pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install cut sections of polyolefin pipe and sheet insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.11 FIELD-APPLIED JACKET INSTALLATION

A. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

- D. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.13 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - 1. Drainage piping located in crawl spaces.
 - 2. Underground piping.
 - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.14 INDOOR PIPING INSULATION SCHEDULE

- A. Domestic Cold Water:
 - 1. NPS 1 and Smaller: Insulation shall be one of the following:
 - a. Cellular Glass: 1-1/2 inches thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - d. Phenolic: 1 inch thick.
 - e. Polyolefin: 1 inch thick.
 - 2. NPS 1-1/4 and Larger: Insulation shall be one of the following:
 - a. Cellular Glass: 1-1/2 inches thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - d. Phenolic: 1 inch thick.
 - e. Polyolefin: 1 inch thick.
- B. Domestic Hot and Recirculated Hot Water:
 - 1. NPS 1-1/4 and Smaller: Insulation shall be one of the following:
 - a. Cellular Glass: 1-1/2 inches thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - d. Phenolic: 1 inch thick.
 - e. Polyolefin: 1 inch thick.
 - 2. NPS 1-1/2 and Larger: Insulation shall be one of the following:

- a. Cellular Glass: 1-1/2 inches thick.
- b. Flexible Elastomeric: 1 inch thick.
- c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
- d. Phenolic: 1 inch thick.
- e. Polyolefin: 1 inch thick.

C. Stormwater:

- 1. All Pipe Sizes: Insulation shall be one of the following:
 - a. Cellular Glass: 1-1/2 inch thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - d. Phenolic: 1 inch thick.
 - e. Polyolefin: 1 inch thick.

D. Roof Drain Bodies:

- 1. All Pipe Sizes: Insulation shall be one of the following:
 - a. Cellular Glass: 1-1/2 inch thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - d. Phenolic: 1 inch thick.
 - e. Polyolefin: 1 inch thick.

E. Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities:

- 1. All Pipe Sizes: Insulation shall be one of the following:
 - a. Flexible Elastomeric: 1/2 inch thick.
 - b. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.
 - c. Polyolefin: 1/2 inch thick.

3.15 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Concealed:
 - 1. None.
- D. Piping, Exposed:
 - 1. PVC, Color-Coded by System: 20 mils thick.

END OF SECTION 220719

PLUMBING PIPING INSULATION

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SECTION 221116 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Under-building-slab and aboveground domestic water pipes, tubes, and fittings inside buildings.
- 2. Encasement for piping.

- B. Related Requirements:

- 1. Section 221113 "Facility Water Distribution Piping" for water-service piping outside the building from source to the point where water-service piping enters the building.

1.3 ACTION SUBMITTALS

- A. Product Data: For transition fittings and dielectric fittings.

1.4 INFORMATIONAL SUBMITTALS

- A. System purging and disinfecting activities report.
- B. Field quality-control reports.

1.5 FIELD CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 - 1. Notify Architect, Construction Manager, or Owner no fewer than five days in advance of proposed interruption of water service.
 - 2. Do not interrupt water service without Architect's, Construction Manager's, or Owner's written permission.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.
- B. Potable-water piping and components shall comply with NSF 14 and NSF 61 Annex G. Plastic piping components shall be marked with "NSF-pw."

2.2 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type L and ASTM B 88, Type M water tube, drawn temper.
- B. Soft Copper Tube: ASTM B 88, Type K and ASTM B 88, Type L water tube, annealed temper.
- C. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.
- D. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
- E. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
- F. Copper Unions:
 - 1. MSS SP-123.
 - 2. Cast-copper-alloy, hexagonal-stock body.
 - 3. Ball-and-socket, metal-to-metal seating surfaces.
 - 4. Solder-joint or threaded ends.
- G. Copper Pressure-Seal-Joint Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. Elkhart Products Corporation.
 - c. Mueller Industries, Inc.
 - d. NIBCO INC.
 - e. Viega LLC.
 - 2. Fittings for NPS 2 and Smaller: Wrought-copper fitting with EPDM-rubber, O-ring seal in each end.
 - 3. Fittings for NPS 2-1/2 to NPS 4: Cast-bronze or wrought-copper fitting with EPDM-rubber, O-ring seal in each end.
- H. Copper Push-on-Joint Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Apollo Flow Controls; Conbraco Industries, Inc.
- b. Elkhart Products Corporation.
- c. NIBCO INC.
- d. Victaulic Company.

2. Description:

- a. Cast-copper fitting complying with ASME B16.18 or wrought-copper fitting complying with ASME B 16.22.
- b. Stainless-steel teeth and EPDM-rubber, O-ring seal in each end instead of solder-joint ends.

I. Copper-Tube, Extruded-Tee Connections:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. T-DRILL Industries Inc.

2. Description: Tee formed in copper tube according to ASTM F 2014.

2.3 CPVC PIPING

A. CPVC Pipe: ASTM F 441/F 441M, Schedule 40.

1. CPVC Socket Fittings: ASTM F 438 for Schedule 40.
2. CPVC Threaded Fittings: ASTM F 437, Schedule 80.

B. CPVC Piping System: ASTM D 2846/D 2846M, SDR 11, pipe and socket fittings.

C. CPVC Tubing System: ASTM D 2846/D 2846M, SDR 11, tube and socket fittings.

2.4 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials:

1. AWWA C110/A21.10, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free unless otherwise indicated.
2. Full-face or ring type unless otherwise indicated.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys.

D. Flux: ASTM B 813, water flushable.

E. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

- F. Solvent Cements for Joining CPVC Piping and Tubing: ASTM F 493.
 - 1. CPVC solvent cement shall have a VOC content of 490 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Solvent cement and adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- G. Plastic, Pipe-Flange Gaskets, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.5 ENCASEMENT FOR PIPING

- A. Standard: ASTM A 674 or AWWA C105/A21.5.
- B. Form: Sheet or tube.
- C. Color: Black or natural.

2.6 TRANSITION FITTINGS

- A. General Requirements:
 - 1. Same size as pipes to be joined.
 - 2. Pressure rating at least equal to pipes to be joined.
 - 3. End connections compatible with pipes to be joined.
- B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
- C. Sleeve-Type Transition Coupling: AWWA C219.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cascade Waterworks Mfg. Co.
 - b. Dresser, Inc.
 - c. Ford Meter Box Company, Inc. (The).
 - d. Jay R. Smith Mfg. Co.
 - e. JCM Industries, Inc.
 - f. Romac Industries, Inc.
 - g. Smith-Blair, Inc.
 - h. Viking Johnson.
- D. Plastic-to-Metal Transition Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Charlotte Pipe and Foundry Company.
 - b. Harvel Plastics, Inc.
 - c. Sioux Chief Manufacturing Company, Inc.
 - d. Spears Manufacturing Company.
 - e. Uponor.
 2. Description:
 - a. CPVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions.
 - b. One end with threaded brass insert and one solvent-cement-socket end.
- E. Plastic-to-Metal Transition Unions:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Colonial Engineering, Inc.
 - b. NIBCO, INC.
 - c. Spears Manufacturing Company.
 2. Description:
 - a. CPVC four-part union.
 - b. Brass or stainless-steel threaded end.
 - c. Solvent-cement-joint plastic end.
 - d. Rubber O-ring.
 - e. Union nut.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Comply with requirements in Section 312000 "Earth Moving" for excavating, trenching, and backfilling.

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."
- C. Install underground copper tube in PE encasement according to ASTM A 674 or AWWA C105/A21.5.

- D. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve inside the building at each domestic water-service entrance. Comply with requirements for pressure gages in Section 220519 "Meters and Gages for Plumbing Piping" and with requirements for drain valves and strainers in Section 221119 "Domestic Water Piping Specialties."
- E. Install domestic water piping level without pitch and plumb.
- F. Rough-in domestic water piping for water-meter installation according to utility company's requirements.
- G. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- H. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- I. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- J. Install piping to permit valve servicing.
- K. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.
- L. Install piping free of sags and bends.
- M. Install fittings for changes in direction and branch connections.
- N. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
- O. Install pressure gages on suction and discharge piping for each plumbing pump and packaged booster pump. Comply with requirements for pressure gages in Section 220519 "Meters and Gages for Plumbing Piping."
- P. Install thermostats in hot-water circulation piping. Comply with requirements for thermostats in Section 221123 "Domestic Water Pumps."
- Q. Install thermometers on outlet piping from each water heater. Comply with requirements for thermometers in Section 220519 "Meters and Gages for Plumbing Piping."
- R. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- S. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- T. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.3 JOINT CONSTRUCTION

- A. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- B. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- C. Brazed Joints for Copper Tubing: Comply with CDA's "Copper Tube Handbook," "Brazed Joints" chapter.
- D. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- E. Pressure-Sealed Joints for Copper Tubing: Join copper tube and pressure-seal fittings with tools recommended by fitting manufacturer.
- F. Push-on Joints for Copper Tubing: Clean end of tube. Measure insertion depth with manufacturer's depth gage. Join copper tube and push-on-joint fittings by inserting tube to measured depth.
- G. Extruded-Tee Connections: Form tee in copper tube according to ASTM F 2144. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.
- H. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.
- I. Joint Construction for Solvent-Cemented Plastic Piping: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements. Apply primer.
 - 2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.

3.4 TRANSITION FITTING INSTALLATION

- A. Install transition couplings at joints of dissimilar piping.
- B. Transition Fittings in Underground Domestic Water Piping:
 - 1. Fittings for NPS 1-1/2 and Smaller: Fitting-type coupling.
 - 2. Fittings for NPS 2 and Larger: Sleeve-type coupling.

- C. Transition Fittings in Aboveground Domestic Water Piping NPS 2 and Smaller: Plastic-to-metal transition unions.

3.5 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for seismic-restraint devices in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- B. Comply with requirements for pipe hanger, support products, and installation in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
 - 1. Vertical Piping: MSS Type 8 or 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
 - 2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 - 4. NPS 2-1/2: 108 inches with 1/2-inch rod.
 - 5. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
- F. Install supports for vertical copper tubing every 10 feet.
- G. Install vinyl-coated hangers for CPVC piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1 and Smaller: 36 inches with 3/8-inch rod.
 - 2. NPS 1-1/4 to NPS 2: 48 inches with 3/8-inch rod.
 - 3. NPS 2-1/2 to NPS 3-1/2: 48 inches with 1/2-inch rod.
 - 4. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
- H. Install supports for vertical CPVC piping every 60 inches for NPS 1 and smaller, and every 72 inches for NPS 1-1/4 and larger.
- I. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.
- C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
 - 1. Domestic Water Booster Pumps: Cold-water suction and discharge piping.
 - 2. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
 - 3. Plumbing Fixtures: Cold- and hot-water-supply piping in sizes indicated, but not smaller than that required by plumbing code.
 - 4. Equipment: Cold- and hot-water-supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.7 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification materials and installation in Section 220553 "Identification for Plumbing Piping and Equipment."
- B. Label pressure piping with system operating pressure.

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Piping Inspections:
 - a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
 - b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
 - 1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
 - 2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
 - c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.

- d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
2. Piping Tests:
- a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
 - b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
 - c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 - d. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 - e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
 - f. Prepare reports for tests and for corrective action required.
- B. Domestic water piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.
- 3.9 ADJUSTING
- A. Perform the following adjustments before operation:
- 1. Close drain valves, hydrants, and hose bibbs.
 - 2. Open shutoff valves to fully open position.
 - 3. Open throttling valves to proper setting.
 - 4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
 - a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
 - b. Adjust calibrated balancing valves to flows indicated.
 - 5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
 - 6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
 - 7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
 - 8. Check plumbing specialties and verify proper settings, adjustments, and operation.
- 3.10 CLEANING
- A. Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
 - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
 - d. Repeat procedures if biological examination shows contamination.
 - e. Submit water samples in sterile bottles to authorities having jurisdiction.

B. Clean non-potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging procedures prescribed by authorities having jurisdiction or; if methods are not prescribed, follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

C. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.

D. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.11 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.
- D. Under-building-slab, domestic water, building-service piping, NPS 3 and smaller, shall be the following:

1. Soft copper tube, ASTM B 88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
- E. Under-building-slab, domestic water piping, NPS 2 and smaller, shall be the following:
1. Hard copper tube, ASTM B 88, Type L; wrought-copper, solder-joint fittings; and brazed sealed joints.
- F. Aboveground domestic water piping, NPS 2 and smaller, shall be one of the following:
1. Hard copper tube, ASTM B 88, Type L; cast- or wrought- copper, solder-joint fittings; and soldered joints.
 2. Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.
 3. Hard copper tube, ASTM B 88, Type L; copper push-on-joint fittings; and push-on joints.
 4. CPVC, Schedule 40; socket fittings; and solvent-cemented joints.
 5. CPVC, Schedule 80 pipe; CPVC, Schedule 80 threaded fittings; and threaded joints.
 6. CPVC Tubing System: CPVC tube; CPVC socket fittings; and solvent-cemented joints. NPS 1-1/2 and NPS 2 CPVC pipe with CPVC socket fittings may be used instead of tubing.
- G. Aboveground domestic water piping, NPS 2-1/2 to NPS 4, shall be one of the following:
1. Hard copper tube, ASTM B 88, Type L; cast- or wrought- copper, solder-joint fittings; and soldered joints.
 2. Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.
 3. CPVC, Schedule 40; socket fittings; and solvent-cemented joints.
 4. CPVC, Schedule 80 pipe; CPVC, Schedule 80 threaded fittings; and threaded joints.

3.12 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
1. Shutoff Duty: Use ball or gate valves for piping NPS 2 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 and larger.
 2. Throttling Duty: Use ball or globe valves for piping NPS 2 and smaller. Use butterfly or ball valves with flanged ends for piping NPS 2-1/2 and larger.
 3. Hot-Water Circulation Piping, Balancing Duty: Calibrated balancing valves.
 4. Drain Duty: Hose-end drain valves.
- B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

END OF SECTION 221116

SECTION 221119 - DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
- B. Related Requirements:
 - 1. Section 220519 "Meters and Gages for Plumbing Piping" for thermometers, pressure gages, and flow meters in domestic water piping.
 - 2. Section 221116 "Domestic Water Piping" for water meters.
 - 3. Section 224716 "Pressure Water Coolers" for water filters for water coolers.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For domestic water piping specialties.
 - 1. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

- A. Potable-water piping and components shall comply with NSF 61 Annex G and NSF 14. Mark "NSF-pw" on plastic piping components.

2.2 PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.3 DOMESTIC WATER PIPING SPECIALTIES

- A. Refer to Plumbing Fixture Schedule on Drawings for specialty item, make, model number and description.

2.4 SPECIALTY VALVES

- A. Comply with requirements for general-duty metal valves in Section 220523.12 "Ball Valves for Plumbing Piping," and Section 220523.14 "Check Valves for Plumbing Piping."

- B. CPVC Union Ball Valves:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. American Valve, Inc.
 - b. Asahi/America.
 - c. Colonial Engineering, Inc.
 - d. Georg Fischer Inc.
 - e. Hayward Flow Control.
 - f. IPEX USA LLC.
 - g. NIBCO INC.
 - h. Spears Manufacturing Company.
 - i. Thermoplastic Valves, Inc.

- 2. Description:

- a. Standard: MSS SP-122.
 - b. Pressure Rating and Temperature: 125 psig at 73 deg F.
 - c. Body Material: CPVC.
 - d. Body Design: Union type.
 - e. End Connections for Valves NPS 2 and Smaller: Detachable, socket.
 - f. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, socket or threaded.
 - g. Ball: CPVC; full port.
 - h. Seals: PTFE or EPDM-rubber O-rings.
 - i. Handle: Tee shaped.

- C. CPVC Non-Union Ball Valves:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. American Valve, Inc.
 - b. Asahi/America.

- c. KBI (King Bros. Industries).
- d. Legend Valve & Fitting, Inc.
- e. NIBCO INC.
- f. Spears Manufacturing Company.
- g. Thermoplastic Valves, Inc.

2. Description:

- a. Standard: MSS SP-122.
- b. Pressure Rating and Temperature: 125 psig at 73 deg F.
- c. Body Material: CPVC.
- d. Body Design: Non-union type.
- e. End Connections: Socket or threaded.
- f. Ball: CPVC; full or reduced port.
- g. Seals: PTFE or EPDM-rubber O-rings.
- h. Handle: Tee shaped.

D. CPVC Ball Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. American Valve, Inc.
- b. Asahi/America.
- c. Colonial Engineering, Inc.
- d. Georg Fischer Inc.
- e. Hayward Flow Control.
- f. IPEX USA LLC.
- g. NIBCO INC.
- h. Spears Manufacturing Company.
- i. Thermoplastic Valves, Inc.

2. Description:

- a. Pressure Rating and Temperature: 125 psig at 73 deg F.
- b. Body Material: CPVC.
- c. Body Design: Union-type ball check.
- d. End Connections for Valves NPS 2 and Smaller: Detachable, socket.
- e. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, socket or threaded.
- f. Ball: CPVC.
- g. Seals: EPDM- or FKM-rubber O-rings.

2.5 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1. Flex-Hose Co., Inc.
- 2. Mason Industries, Inc.
- 3. Metraflex Company (The).

- B. Bronze-Hose Flexible Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.
 - 1. Working-Pressure Rating: Minimum 200 psig.
 - 2. End Connections NPS 2 and Smaller: Threaded copper pipe or plain-end copper tube.
 - 3. End Connections NPS 2-1/2 and Larger: Flanged copper alloy.
- C. Stainless-Steel-Hose Flexible Connectors: Corrugated-stainless-steel tubing with stainless-steel wire-braid covering and ends welded to inner tubing.
 - 1. Working-Pressure Rating: Minimum 200 psig.
 - 2. End Connections NPS 2 and Smaller: Threaded steel-pipe nipple.
 - 3. End Connections NPS 2-1/2 and Larger: Flanged steel nipple.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.
 - 1. Locate backflow preventers in same room as connected equipment or system.
 - 2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe-to-floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are unacceptable for this application.
 - 3. Do not install bypass piping around backflow preventers.
- B. Install water regulators with inlet and outlet shutoff valves and bypass with memory-stop balancing valve. Install pressure gages on inlet and outlet.
- C. Install water-control valves with inlet and outlet shutoff valve and bypass with globe valve. Install pressure gages on inlet and outlet.
- D. Install balancing valves in locations where they can easily be adjusted.
- E. Install temperature-actuated, water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
 - 1. Install cabinet-type units recessed in or surface mounted on wall as specified.
- F. Install Y-pattern strainers for water on supply side of each control valve, water pressure-reducing valve, solenoid valve and pump.
- G. Install outlet boxes recessed in wall or surface mounted on wall. Install 2-by-4-inch fire-retardant-treated-wood blocking, wall reinforcement between studs. Comply with requirements for fire-retardant-treated-wood blocking in Section 061000 "Rough Carpentry."
- H. Install hose stations with check stops or shutoff valves on inlets and with thermometer on outlet.

1. Install cabinet-type units recessed in or surface mounted on wall as specified. Install 2-by-4-inch fire-retardant-treated-wood blocking, wall reinforcement between studs. Comply with requirements for fire-retardant-treated-wood blocking in Section 061000 "Rough Carpentry."
 - I. Install water-hammer arresters in water piping according to PDI-WH 201.
 - J. Install air vents at high points of water piping. Install drain piping and discharge onto floor drain.
 - K. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
 - L. Install drainage-type, trap-seal primer valves as lavatory trap with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting.
 - M. Install trap-seal primer systems with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust system for proper flow.
- 3.2 CONNECTIONS
- A. Comply with requirements for ground equipment in Section 260526 "Grounding and Bonding for Electrical Systems."
 - B. Fire-retardant-treated-wood blocking is specified in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for electrical connections.
- 3.3 LABELING AND IDENTIFYING
- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
 1. Pressure vacuum breakers.
 2. Intermediate atmospheric-vent backflow preventers.
 3. Reduced-pressure-principle backflow preventers.
 4. Double-check, backflow-prevention assemblies.
 5. Carbonated-beverage-machine backflow preventers.
 6. Dual-check-valve backflow preventers.
 7. Reduced-pressure-detector, fire-protection, backflow-preventer assemblies.
 8. Double-check, detector-assembly backflow preventers.
 9. Water pressure-reducing valves.
 10. Calibrated balancing valves.
 11. Primary, thermostatic, water mixing valves.
 12. Manifold, thermostatic, water mixing-valve assemblies.
 13. Photographic-process, thermostatic, water mixing-valve assemblies.
 14. Primary water tempering valves.
 15. Outlet boxes.
 16. Hose stations.
 17. Supply-type, trap-seal primer valves.

18. Trap-seal primer systems.

- B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Test each pressure vacuum breaker, reduced-pressure-principle backflow preventer, double-check, backflow-prevention assembly and double-check, detector-assembly backflow preventer according to authorities having jurisdiction and the device's reference standard.
- B. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Set field-adjustable pressure set points of water pressure-reducing valves.
- B. Set field-adjustable flow set points of balancing valves.
- C. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.

END OF SECTION 221119

SECTION 221123 - DOMESTIC WATER PUMPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. In-line, sealless centrifugal pumps.

1.2 ACTION SUBMITTALS

- ##### A. Product Data:
- For each type of product indicated. Include materials of construction, rated capacities, certified performance curves with operating points plotted on curves, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.3 CLOSEOUT SUBMITTALS

- ##### A. Operation and Maintenance Data:
- For domestic water pumps to include in operation and maintenance manuals.

1.4 QUALITY ASSURANCE

- ##### A. Electrical Components, Devices, and Accessories:
- Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- ##### B. UL Compliance:
- Comply with UL 778 for motor-operated water pumps.

PART 2 - PRODUCTS

2.1 IN-LINE, SEALLESS CENTRIFUGAL PUMPS

- ##### A. Description:
- Factory-assembled and -tested, in-line, close-coupled, canned-motor, sealless, overhung-impeller centrifugal pumps.
- ##### B. Pump Construction:
1. Pump and Motor Assembly: Hermetically sealed, replaceable-cartridge type with motor and impeller on common shaft and designed for installation with pump and motor shaft horizontal.
 2. Casing: Bronze, with threaded or companion-flange connections.
 3. Impeller: Plastic.
 4. Motor: Single speed, unless otherwise indicated.

C. Capacities and Characteristics:

1. See Schedule on Plumbing Drawings.

2.2 MOTORS

A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 220513 "Common Motor Requirements for Plumbing Equipment."

1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

2.3 CONTROLS

A. Thermostats: Electric; adjustable for control of hot-water circulation.

1. Type: Water-immersion temperature sensor, for installation in piping.
2. Range: 50 to 125 deg F for hot water return serving the REC.
3. Operation of Pump: On or off.
4. Power Requirement: 120 V, ac.
5. Settings: Start pump at 105 deg F for hot water return serving the REC, and stop pump at 110 deg F for hot water return serving the REC.

PART 3 - EXECUTION

3.1 PUMP INSTALLATION

- A. Comply with HI 1.4.
- B. Install in-line, sealless centrifugal pumps with shaft horizontal unless otherwise indicated.
- C. Install continuous-thread hanger rods and spring hangers of size required to support pump weight.
 1. Comply with requirements for hangers and supports specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- D. Install thermostats in hot-water return piping.

3.2 CONNECTIONS

- A. Comply with requirements for piping specified in Section 221116 "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to pumps to allow service and maintenance.

- C. Connect domestic water piping to pumps. Install suction and discharge piping equal to or greater than size of pump nozzles.
- D. Install shutoff valve and strainer on suction side of each pump, and check, shutoff, and throttling valves on discharge side of each pump. Install valves same size as connected piping. Comply with requirements for valves specified in Section 220523.12 "Ball Valves for Plumbing Piping," Section 220523.14 "Check Valves for Plumbing Piping," and comply with requirements for strainers specified in Section 221119 "Domestic Water Piping Specialties."
 - 1. Install pressure gage at suction of each pump and pressure gage at discharge of each pump. Install at integral pressure-gage tapings where provided or install pressure-gage connectors in suction and discharge piping around pumps. Comply with requirements for pressure gages specified in Section 220519 "Meters and Gages for Plumbing Piping."
- E. Connect thermostats to pumps that they control.

3.3 IDENTIFICATION

- A. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment" for identification of pumps.

3.4 ADJUSTING

- A. Adjust domestic water pumps to function smoothly, and lubricate as recommended by manufacturer.
- B. Adjust initial temperature set points.
- C. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

END OF SECTION 221123

SECTION 221316 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe, tube, and fittings.
 - 2. Specialty pipe fittings.
 - 3. Encasement for underground metal piping.

1.3 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water.
 - 2. Waste, Force-Main Piping: 50 psig.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For sovent drainage system. Include plans, elevations, sections, and details.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF/ANSI 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping and "NSF-sewer" for plastic sewer piping.

1.7 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Waste Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
 - 1. Notify Architect, Construction Manager, or Owner no fewer than five days in advance of proposed interruption of sanitary waste service.
 - 2. Do not proceed with interruption of sanitary waste service without Architect's, Construction Manager's, or Owner's written permission.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Service class(es).
- B. Gaskets: ASTM C 564, rubber.
- C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.3 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. Sovent Stack Fittings: ASME B16.45 or ASSE 1043, hubless, cast-iron aerator and deaerator drainage fittings.
- C. CISPI, Hubless-Piping Couplings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Dallas Specialty & Mfg. Co.
 - d. Fernco Inc.
 - e. Ideal Clamp Products, Inc.
 - f. Josam Company.
 - g. Matco-Norca.
 - h. MIFAB, Inc.
 - i. Mission Rubber Company, LLC; a division of MCP Industries.
 - j. NewAge Casting.
 - k. Tyler Pipe; a subsidiary of MCWane Inc.

2. Standards: ASTM C 1277 and CISPI 310.
3. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

D. Heavy-Duty, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Clamp-All Corp.
 - d. Dallas Specialty & Mfg. Co.
 - e. Ideal Clamp Products, Inc.
 - f. MIFAB, Inc.
 - g. Mission Rubber Company, LLC; a division of MCP Industries.
 - h. NewAge Casting.
 - i. Tyler Pipe; a subsidiary of MCWane Inc.
2. Standards: ASTM C 1277 and ASTM C 1540.
3. Description: Stainless-steel shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

E. Cast-Iron, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Charlotte Pipe and Foundry Company.
 - b. MG Piping Products Company.
2. Standard: ASTM C 1277.
3. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.4 GALVANIZED-STEEL PIPE AND FITTINGS

- A. Galvanized-Steel Pipe: ASTM A 53/A 53M, Type E, Standard Weight class. Include square-cut-grooved or threaded ends matching joining method.
- B. Cast-Iron Drainage Fittings: ASME B16.12, threaded.
- C. Steel Pipe Pressure Fittings:
 1. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106/A 106M, Schedule 40, seamless steel pipe. Include ends matching joining method.
 2. Malleable-Iron Unions: ASME B16.39; Class 150; hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface; and female threaded ends.
 3. Gray-Iron, Threaded Fittings: ASME B16.4, Class 125, standard pattern.

D. Cast-Iron Flanges: ASME B16.1, Class 125.

1. Flange Gasket Materials: ASME B16.21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

E. Grooved-Joint, Galvanized-Steel-Pipe Appurtenances:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. Grinnell G-Fire by Johnson Controls Company.
 - c. Shurjoint-Apollo Piping Products USA Inc.
 - d. Smith-Cooper International.
 - e. Victaulic Company.
2. Galvanized, Grooved-End Fittings for Galvanized-Steel Piping: ASTM A 536 ductile-iron castings, ASTM A 47/A 47M malleable-iron castings, ASTM A 234/A 234M forged steel fittings, or ASTM A 106/A 106M steel pipes with dimensions matching ASTM A 53/A 53M steel pipe, and complying with AWWA C606 for grooved ends.
3. Grooved Mechanical Couplings for Galvanized-Steel Piping: ASTM F 1476, Type I. Include ferrous housing sections with continuous curved keys; EPDM-rubber gasket suitable for hot and cold water; and bolts and nuts.

2.5 STAINLESS-STEEL PIPE AND FITTINGS

- A. Pipe and Fittings: ASME A112.3.1, drainage pattern with socket and spigot ends.
- B. Internal Sealing Rings: Elastomeric gaskets shaped to fit socket groove.

2.6 DUCTILE-IRON PIPE AND FITTINGS

A. Ductile-Iron, Mechanical-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Ductile-Iron Fittings: AWWA C110/A21.10, mechanical-joint, ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
3. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

B. Ductile-Iron, Push-on-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Ductile-Iron Fittings: AWWA C110/A21.10, push-on-joint ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
3. Gaskets: AWWA C111/A21.11, rubber.

C. Ductile-Iron, Grooved-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51 with round-cut-grooved ends according to AWWA C606.
2. Ductile-Iron-Pipe Appurtenances:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Anvil International.
 - 2) Shurjoint-Apollo Piping Products USA Inc.
 - 3) Smith-Cooper International.
 - 4) Star Pipe Products.
 - 5) Victaulic Company.
 - b. Grooved-End, Ductile-Iron Fittings: ASTM A 536 ductile-iron castings with dimensions matching AWWA C110/A 21.10 ductile-iron pipe or AWWA C153/A 21.53 ductile-iron fittings and complying with AWWA C606 for grooved ends.
 - c. Grooved Mechanical Couplings for Ductile-Iron Pipe: ASTM F 1476, Type I. Include ferrous housing sections with continuous curved keys; EPDM-rubber center-leg gasket suitable for hot and cold water; and bolts and nuts.

2.7 COPPER TUBE AND FITTINGS

- A. Copper DWV Tube: ASTM B 306, drainage tube, drawn temper.
- B. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.
- C. Hard Copper Tube: ASTM B 88, Type L and Type M, water tube, drawn temper.
- D. Soft Copper Tube: ASTM B 88, Type L, water tube, annealed temper.
- E. Copper Pressure Fittings:
 1. Copper Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
 2. Copper Unions: MSS SP-123, copper-alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.
- F. Copper Flanges: ASME B16.24, Class 150, cast copper with solder-joint end.
 1. Flange Gasket Materials: ASME B16.21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- G. Solder: ASTM B 32, lead free with ASTM B 813, water-flushable flux.

2.8 ABS PIPE AND FITTINGS

- A. Solid-Wall ABS Pipe: ASTM D 2661, Schedule 40.
- B. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.
- C. Solvent Cement: ASTM D 2235.
 - 1. ABS solvent cement shall have a VOC content of 325 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.9 PVC PIPE AND FITTINGS

- A. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
- B. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.
- C. Adhesive Primer: ASTM F 656.
 - 1. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Solvent Cement: ASTM D 2564.
 - 1. PVC solvent cement shall have a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.10 SPECIALTY PIPE FITTINGS

- A. Transition Couplings:
 - 1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.
 - 2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
 - 3. Unshielded, Nonpressure Transition Couplings:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) Dallas Specialty & Mfg. Co.
 - 2) Fernco Inc.
 - 3) Froet Industries LLC.
 - 4) Mission Rubber Company, LLC; a division of MCP Industries.
 - 5) Plastic Oddities.
- b. Standard: ASTM C 1173.
 - c. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
 - d. Sleeve Materials:
 - 1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
 - 2) For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 - 3) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
4. Shielded, Nonpressure Transition Couplings:
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Cascade Waterworks Mfg. Co.
 - 2) Mission Rubber Company, LLC; a division of MCP Industries.
 - b. Standard: ASTM C 1460.
 - c. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
5. Pressure Transition Couplings:
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Apollo Flow Controls; Conbraco Industries, Inc.
 - 2) Cascade Waterworks Mfg. Co.
 - 3) Dresser, Inc.
 - 4) EBAA Iron, Inc.
 - 5) Ford Meter Box Company, Inc. (The).
 - 6) Jay R. Smith Mfg Co; a division of Morris Group International.
 - 7) JCM Industries, Inc.
 - 8) Romac Industries, Inc.
 - 9) Viking Johnson.
 - b. Standard: AWWA C219.
 - c. Description: Metal, sleeve-type same size as, with pressure rating at least equal to, and ends compatible with, pipes to be joined.
 - d. Center-Sleeve Material: Manufacturer's standard.
 - e. Gasket Material: Natural or synthetic rubber.
 - f. Metal Component Finish: Corrosion-resistant coating or material.

B. Dielectric Fittings:

1. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
2. Dielectric Unions:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) A.Y. McDonald Mfg. Co.
 - 2) Capitol Manufacturing Company.
 - 3) Central Plastics Company.
 - 4) HART Industrial Unions, LLC.
 - 5) Jomar Valve.
 - 6) Matco-Norca.
 - 7) WATTS.
 - 8) Wilkins.
 - 9) Zurn Industries, LLC.
 - b. Description:
 - 1) Standard: ASSE 1079.
 - 2) Pressure Rating: 125 psig minimum at 180 deg F.
 - 3) End Connections: Solder-joint copper alloy and threaded ferrous.
3. Dielectric Flanges:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Capitol Manufacturing Company.
 - 2) Central Plastics Company.
 - 3) Matco-Norca.
 - 4) WATTS.
 - 5) Wilkins.
 - 6) Zurn Industries, LLC.
 - b. Description:
 - 1) Standard: ASSE 1079.
 - 2) Factory-fabricated, bolted, companion-flange assembly.
 - 3) Pressure Rating: 125 psig minimum at 180 deg F.
 - 4) End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
4. Dielectric-Flange Insulating Kits:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Advance Products & Systems, Inc.
 - 2) Calpico, Inc.
 - 3) Central Plastics Company.

4) Pipeline Seal and Insulator, Inc.

b. Description:

- 1) Nonconducting materials for field assembly of companion flanges.
- 2) Pressure Rating: 150 psig.
- 3) Gasket: Neoprene or phenolic.
- 4) Bolt Sleeves: Phenolic or polyethylene.
- 5) Washers: Phenolic with steel backing washers.

5. Dielectric Nipples:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) Elster Perfection Corporation.
- 2) Grinnell G-Fire by Johnson Controls Company.
- 3) Josam Company.
- 4) Matco-Norca.
- 5) Precision Plumbing Products.
- 6) Victaulic Company.

b. Description:

- 1) Standard: IAPMO PS 66
- 2) Electroplated steel nipple.
- 3) Pressure Rating: 300 psig at 225 deg F.
- 4) End Connections: Male threaded or grooved.
- 5) Lining: Inert and noncorrosive, propylene.

2.11 ENCASEMENT FOR UNDERGROUND METAL PIPING

- A. Standard: ASTM A 674 or AWWA C105/A 21.5.
- B. Material: Linear low-density polyethylene film of 0.008-inch or high-density, cross-laminated polyethylene film of 0.004-inch minimum thickness.
- C. Form: Sheet or tube.
- D. Color: Black or natural.

PART 3 - EXECUTION

3.1 EARTH MOVING

- A. Comply with requirements for excavating, trenching, and backfilling specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- K. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- L. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:
 - 1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
 - 2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
 - 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- M. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

1. Install encasement on underground piping according to ASTM A 674 or AWWA C105/A 21.5.
- N. Install steel piping according to applicable plumbing code.
- O. Install stainless-steel piping according to ASME A112.3.1 and applicable plumbing code.
- P. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."
- Q. Install aboveground ABS piping according to ASTM D 2661.
- R. Install aboveground PVC piping according to ASTM D 2665.
- S. Install underground ABS and PVC piping according to ASTM D 2321.
- T. Install engineered soil and waste drainage and vent piping systems as follows:
1. Combination Waste and Vent: Comply with standards of authorities having jurisdiction.
 2. Solvent Drainage System: Comply with ASSE 1043 and solvent fitting manufacturer's written installation instructions.
 3. Reduced-Size Venting: Comply with standards of authorities having jurisdiction.
- U. Install underground, ductile-iron, force-main piping according to AWWA C600. Install buried piping inside building between wall and floor penetrations and connection to sanitary sewer piping outside building with restrained joints. Anchor pipe to wall or floor. Install thrust-block supports at vertical and horizontal offsets.
1. Install encasement on piping according to ASTM A 674 or AWWA C105/A 21.5.
- V. Install underground, copper, force-main tubing according to CDA's "Copper Tube Handbook."
1. Install encasement on piping according to ASTM A 674 or AWWA C105/A 21.5.
- W. Install force mains at elevations indicated.
- X. Plumbing Specialties:
1. Install backwater valves in sanitary waste gravity-flow piping. Comply with requirements for backwater valves specified in Section 221319 "Sanitary Waste Piping Specialties."
 2. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary drainage gravity-flow piping. Install cleanout fitting with closure plug inside the building in sanitary drainage force-main piping. Comply with requirements for cleanouts specified in Section 221319 "Sanitary Waste Piping Specialties."
 3. Install drains in sanitary drainage gravity-flow piping. Comply with requirements for drains specified in Section 221319 "Sanitary Waste Piping Specialties."
- Y. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
- Z. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

- AA. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- BB. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.3 JOINT CONSTRUCTION

- A. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
- B. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead-and-oakum calked joints.
- C. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
- D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- E. Join stainless-steel pipe and fittings with gaskets according to ASME A112.3.1.
- F. Join copper tube and fittings with soldered joints according to ASTM B 828. Use ASTM B 813, water-flushable, lead-free flux and ASTM B 32, lead-free-alloy solder.
- G. Grooved Joints: Cut groove ends of pipe according to AWWA C606. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections, over gasket, with keys seated in piping grooves. Install and tighten housing bolts.
- H. Flanged Joints: Align bolt holes. Select appropriate gasket material, size, type, and thickness. Install gasket concentrically positioned. Use suitable lubricants on bolt threads. Torque bolts in cross pattern.
- I. Plastic, Nonpressure-Piping, Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
 - 3. PVC Piping: Join according to ASTM D 2855 and ASTM D 2665 Appendixes.

3.4 SPECIALTY PIPE FITTING INSTALLATION

- A. Transition Couplings:

1. Install transition couplings at joints of piping with small differences in OD's.
2. In Drainage Piping: Shielded, nonpressure transition couplings.
3. In Aboveground Force Main Piping: Fitting-type transition couplings.
4. In Underground Force Main Piping:
 - a. NPS 1-1/2 and Smaller: Fitting-type transition couplings.
 - b. NPS 2 and Larger: Pressure transition couplings.

B. Dielectric Fittings:

1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
2. Dielectric Fittings for NPS 2 and Smaller: Use dielectric unions.
3. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges.
4. Dielectric Fittings for NPS 6 and Larger: Use dielectric flange kits.

3.5 VALVE INSTALLATION

- A. General valve installation requirements are specified in Section 220523.12 "Ball Valves for Plumbing Piping," Section 220523.13 "Butterfly Valves for Plumbing Piping," Section 220523.14 "Check Valves for Plumbing Piping," and Section 220523.15 "Gate Valves for Plumbing Piping."

B. Shutoff Valves:

1. Install shutoff valve on each sewage pump discharge.
2. Install gate or full-port ball valve for piping NPS 2 and smaller.
3. Install gate valve for piping NPS 2-1/2 and larger.

- C. Check Valves: Install swing check valve, between pump and shutoff valve, on each sewage pump discharge.

D. Backwater Valves: Install backwater valves in piping subject to backflow.

1. Horizontal Piping: Horizontal backwater valves. Use normally closed type unless otherwise indicated.
2. Floor Drains: Drain outlet backwater valves unless drain has integral backwater valve.
3. Install backwater valves in accessible locations.
4. Comply with requirements for backwater valve specified in Section 221319 "Sanitary Waste Piping Specialties."

3.6 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."

- B. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
2. Install stainless-steel pipe hangers for horizontal piping in corrosive environments.

3. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
 4. Install stainless-steel pipe support clamps for vertical piping in corrosive environments.
 5. Vertical Piping: MSS Type 8 or Type 42, clamps.
 6. Install individual, straight, horizontal piping runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
 7. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 8. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support horizontal piping and tubing within 12 inches of each fitting, valve, and coupling.
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.
- F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
 2. NPS 3: 60 inches with 1/2-inch rod.
 3. NPS 4: 60 inches with 5/8-inch rod.
 4. NPS 6 and NPS 8: 60 inches with 3/4-inch rod.
 5. Spacing for 10-foot lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.
- G. Install supports for vertical cast-iron soil piping every 15 feet.
- H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4: 84 inches with 3/8-inch rod.
 2. NPS 1-1/2: 108 inches with 3/8-inch rod.
 3. NPS 2: 10 feet with 3/8-inch rod.
 4. NPS 2-1/2: 11 feet with 1/2-inch rod.
 5. NPS 3: 12 feet with 1/2-inch rod.
 6. NPS 4: 12 feet with 5/8-inch rod.
 7. NPS 6 and NPS 8: 12 feet with 3/4-inch rod.
- I. Install supports for vertical steel piping every 15 feet.
- J. Install hangers for stainless-steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 2: 84 inches with 3/8-inch rod.
 2. NPS 3: 96 inches with 1/2-inch rod.
 3. NPS 4: 108 inches with 1/2-inch rod.
 4. NPS 6: 10 feet with 5/8-inch rod.

- K. Install supports for vertical stainless-steel piping every 10 feet.
- L. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 - 3. NPS 2-1/2: 108 inches with 1/2-inch rod.
 - 4. NPS 3: 10 feet with 1/2-inch rod.
- M. Install supports for vertical copper tubing every 10 feet.
- N. Install hangers for ABS and PVC piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.
 - 2. NPS 3: 48 inches with 1/2-inch rod.
 - 3. NPS 4: 48 inches with 5/8-inch rod.
 - 4. NPS 6 and NPS 8: 48 inches with 3/4-inch rod.
- O. Install supports for vertical ABS and PVC piping every 48 inches.
- P. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
 - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
 - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
 - 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 - 4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
 - 5. Comply with requirements for cleanouts and drains specified in Section 221319 "Sanitary Waste Piping Specialties."
 - 6. Equipment: Connect drainage piping as indicated. Provide shutoff valve if indicated and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.
- D. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.

E. Make connections according to the following unless otherwise indicated:

1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.8 IDENTIFICATION

- A. Identify exposed sanitary waste and vent piping. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.9 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping except outside leaders on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.

5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 6. Prepare reports for tests and required corrective action.
- E. Test force-main piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 2. Cap and subject piping to static-water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 3. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 4. Prepare reports for tests and required corrective action.

3.10 CLEANING AND PROTECTION

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.
- D. Exposed ABS and PVC Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.

3.11 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground, soil and waste piping NPS 4 and smaller shall be any of the following:
 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Galvanized-steel pipe, drainage fittings, and threaded joints.
 4. Stainless-steel pipe and fittings, sealing rings, and gasketed joints.
 5. Copper DWV tube, copper drainage fittings, and soldered joints.
 6. Solid-wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
 7. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 8. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- C. Aboveground, soil and waste piping NPS 6 and larger shall be any of the following:
 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Galvanized-steel pipe, drainage fittings, and threaded joints.
 4. Stainless-steel pipe and fittings, sealing rings, and gasketed joints.
 5. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 6. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- D. Aboveground, vent piping NPS 4 and smaller shall be any of the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Galvanized-steel pipe, drainage fittings, and threaded joints.
 4. Stainless-steel pipe and fittings gaskets, and gasketed joints.
 5. Copper DWV tube, copper drainage fittings, and soldered joints.
 - a. Option for Vent Piping, NPS 2-1/2 and NPS 3-1/2: Hard copper tube, Type M; copper pressure fittings; and soldered joints.
 6. Solid-wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
 7. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 8. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- E. Underground, soil, waste, and vent piping NPS 4 and smaller shall be any of the following:
1. Service class, cast-iron soil piping; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Stainless-steel pipe and fittings, gaskets, and gasketed joints.
 4. Solid wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
 5. Solid wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 6. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- F. Underground, soil and waste piping NPS 6 and larger shall be any of the following:
1. Service class, cast-iron soil piping; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; coupled joints.
 3. Solid-wall PVC pipe; PVC socket fittings; and solvent-cemented joints.
 4. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.

END OF SECTION 221316

SECTION 221319 - SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. FRP: Fiberglass-reinforced plastic.
- C. HDPE: High-density polyethylene plastic.
- D. PE: Polyethylene plastic.
- E. PP: Polypropylene plastic.
- F. PVC: Polyvinyl chloride plastic.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and accessories for the following:
 - 1. See Plumbing Schedule on drawings.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For drainage piping specialties to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic sanitary piping specialty components.

1.6 COORDINATION

- A. Coordinate size and location of roof penetrations.

PART 2 - PRODUCTS

2.1 SANITARY WASTE PIPING SPECIALTIES

- A. See Schedule on Plumbing Drawings for specialty item, make, model number and description.

2.2 ROOF FLASHING ASSEMBLIES

- A. Roof Flashing Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Acorn Engineering Company; a Division of Morris Group International.
 - b. Thaler Metal Industries Ltd.
 - c. Zurn Industries, LLC.
2. Description: Manufactured assembly made of 4.0-lb/sq. ft., 0.0625-inch-thick, lead flashing collar and skirt extending at least 8 inches from pipe, with galvanized-steel boot reinforcement and counterflashing fitting.
 - a. Open-Top Vent Cap: Without cap.
 - b. Low-Silhouette Vent Cap: With vandal-proof vent cap.
 - c. Extended Vent Cap: With field-installed, vandal-proof vent cap.

2.3 THROUGH-PENETRATION FIRESTOP ASSEMBLIES

- A. Through-Penetration Firestop Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. ProVent Systems.
2. Standard: UL 1479 assembly of sleeve and stack fitting with firestopping plug.
3. Size: Same as connected soil, waste, or vent stack.
4. Sleeve: Molded PVC plastic, of length to match slab thickness and with integral nailing flange on one end for installation in cast-in-place concrete slabs.
5. Stack Fitting: ASTM A 48/A 48M, gray-iron, hubless-pattern, wye branch with neoprene O-ring at base and gray-iron plug in thermal-release harness. Include PVC protective cap for plug.
6. Special Coating: Corrosion resistant on interior of fittings.

2.4 FLASHING MATERIALS

- A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:
 - 1. General Use: 4.0-lb/sq. ft., 0.0625-inch thickness.
 - 2. Vent Pipe Flashing: 3.0-lb/sq. ft., 0.0469-inch thickness.
 - 3. Burning: 6-lb/sq. ft., 0.0938-inch thickness.
- B. Copper Sheet: ASTM B 152/B 152M, of the following minimum weights and thicknesses, unless otherwise indicated:
 - 1. General Applications: 12 oz./sq. ft.
 - 2. Vent Pipe Flashing: 8 oz./sq. ft.
- C. Zinc-Coated Steel Sheet: ASTM A 653/A 653M, with 0.20 percent copper content and 0.04-inch minimum thickness, unless otherwise indicated. Include G90 hot-dip galvanized, mill-phosphatized finish for painting if indicated.
- D. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil minimum thickness.
- E. Fasteners: Metal compatible with material and substrate being fastened.
- F. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.
- G. Solder: ASTM B 32, lead-free alloy.
- H. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
 - 1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
 - 2. Locate at each change in direction of piping greater than 45 degrees.
 - 3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
 - 4. Locate at base of each vertical soil and waste stack.
- B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

- D. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
 - 1. Position floor drains for easy access and maintenance.
 - 2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
 - a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
 - b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
 - c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.
 - 3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
 - 4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- E. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.
- F. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.
- G. Install through-penetration firestop assemblies in plastic conductors and stacks at floor penetrations.
- H. Assemble open drain fittings and install with top of hub 2 inches above floor.
- I. Install deep-seal traps on floor drains and other waste outlets, if indicated.
- J. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.
 - 1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
 - 2. Size: Same as floor drain inlet.
- K. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.
- L. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.
- M. Install wood-blocking reinforcement for wall-mounting-type specialties.
- N. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.2 CONNECTIONS

- A. Comply with requirements in Section 221316 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.

- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- D. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.3 FLASHING INSTALLATION

- A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
 - 1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft., 0.0938-inch thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft., 0.0625-inch thickness or thinner.
 - 2. Copper Sheets: Solder joints of copper sheets.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
 - 1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
 - 2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
 - 3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.
- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Section 076200 "Sheet Metal Flashing and Trim."
- F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.
- G. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.4 LABELING AND IDENTIFYING

- A. Inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.5 FIELD QUALITY CONTROL

- A. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.6 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221319

SECTION 221413 - FACILITY STORM DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe, tube, and fittings.
 - 2. Specialty pipe fittings.
- B. Related Sections:
 - 1. Section 334100 "Storm Utility Drainage Piping" for storm drainage piping outside the building.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF/ANSI 14, "Plastics Piping System Components and Related Materials," for plastic piping components. Include marking with "NSF-drain" for plastic drain piping and "NSF-sewer" for plastic sewer piping.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Storm-Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
 - 1. Notify Construction Manager no fewer than two days in advance of proposed interruption of storm-drainage service.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. CISPI, Hubless-Piping Couplings:
 - 1. Standards: ASTM C 1277 and CISPI 310.
 - 2. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
- C. Heavy-Duty, Hubless-Piping Couplings:
 - 1. Standards: ASTM C 1277 and ASTM C 1540.
 - 2. Description: Stainless-steel shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
- D. Cast-Iron, Hubless-Piping Couplings:
 - 1. Standard: ASTM C 1277.
 - 2. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.3 PVC PIPE AND FITTINGS

- A. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
- B. Cellular-Core PVC Pipe: ASTM F 891, Schedule 40.
- C. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.
- D. Adhesive Primer: ASTM F 656.
 - 1. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Solvent Cement: ASTM D 2564.
 - 1. PVC solvent cement shall have a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 SPECIALTY PIPE FITTINGS

A. Transition Couplings:

1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.
2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified-piping-system fitting.
3. Unshielded, Nonpressure Transition Couplings:
 - a. Standard: ASTM C 1173.
 - b. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
 - c. Sleeve Materials:
 - 1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
 - 2) For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 - 3) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
4. Shielded, Nonpressure Transition Couplings:
 - a. Standard: ASTM C 1460.
 - b. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

PART 3 - EXECUTION

3.1 EARTH MOVING

- A. Comply with requirements for excavating, trenching, and backfilling specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations from layout are approved on coordination drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping at indicated slopes.
- F. Install piping free of sags and bends.
- G. Install fittings for changes in direction and branch connections.
- H. Install piping to allow application of insulation.
- I. Make changes in direction for storm drainage piping using appropriate branches, bends, and long-sweep bends. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- J. Lay buried building storm drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- K. Install storm drainage piping at the following minimum slopes unless otherwise indicated:
 - 1. Building Storm Drain and Horizontal Storm-Drainage Piping: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
- L. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Install encasement on underground piping according to ASTM A 674 or AWWA C105.
- M. Install aboveground PVC piping according to ASTM D 2665.
- N. Install underground PVC piping according to ASTM D 2321.
- O. Plumbing Specialties:
 - 1. Install backwater valves in storm drainage gravity-flow piping. Comply with requirements for backwater valves specified in Section 221423 "Storm Drainage Piping Specialties."
 - 2. Install cleanouts at grade and extend to where building storm drains connect to building storm sewers in storm drainage gravity-flow piping. Install cleanout fitting with closure plug inside the building in storm drainage force-main piping. Comply with requirements for cleanouts specified in Section 221423 "Storm Drainage Piping Specialties."
 - 3. Install drains in storm drainage gravity-flow piping. Comply with requirements for drains specified in Section 221423 "Storm Drainage Piping Specialties."

- P. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
- Q. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- R. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- S. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.3 JOINT CONSTRUCTION

- A. Hubless, Cast-Iron Soil Piping Coupled Joints: Join according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
- B. Plastic, Nonpressure-Piping, Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
 - 3. PVC Piping: Join according to ASTM D 2855 and ASTM D 2665 Appendixes.

3.4 SPECIALTY PIPE FITTING INSTALLATION

- A. Transition Couplings:
 - 1. Install transition couplings at joints of piping with small differences in OD's.
 - 2. In Drainage Piping: Unshielded or Shielded, nonpressure transition couplings.

3.5 VALVE INSTALLATION

- A. Backwater Valves: Install backwater valves in piping subject to backflow.
 - 1. Horizontal Piping: Horizontal backwater valves. Use normally closed type unless otherwise indicated.
 - 2. Install backwater valves in accessible locations.
 - 3. Comply with requirements for backwater valves specified in Section 221423 "Storm Drainage Piping Specialties."

3.6 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
 2. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
 3. Vertical Piping: MSS Type 8 or Type 42, clamps.
 4. Individual, Straight, Horizontal Piping Runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 5. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 6. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Support horizontal piping and tubing within 12 inches of each fitting and coupling.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.
- E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
 2. NPS 3: 60 inches with 1/2-inch rod.
 3. NPS 4: 60 inches with 5/8-inch rod.
 4. NPS 6 and NPS 8: 60 inches with 3/4-inch rod.
 5. Spacing for 10-foot pipe lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.
- F. Install supports for vertical cast-iron soil piping every 15 feet.
- G. Install hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.
 2. NPS 3: 48 inches with 1/2-inch rod.
 3. NPS 4: 48 inches with 5/8-inch rod.
 4. NPS 6 and NPS 8: 48 inches with 3/4-inch rod.
- H. Install supports for vertical PVC piping every 48 inches.
- I. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.
- 3.7 CONNECTIONS
- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect interior storm drainage piping to exterior storm drainage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect storm drainage piping to roof drains and storm drainage specialties.

1. Install test tees (wall cleanouts) in conductors near floor, and floor cleanouts with cover flush with floor.
 2. Install horizontal backwater valves with cleanout cover flush with floor.
 3. Comply with requirements for backwater valves, cleanouts and drains specified in Section 221423 "Storm Drainage Piping Specialties."
- D. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.

3.8 IDENTIFICATION

- A. Identify exposed storm drainage piping. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.9 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in.
 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test storm drainage piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced storm drainage piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Test Procedure: Test storm drainage piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts until completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 5. Prepare reports for tests and required corrective action.

3.10 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.11 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground storm drainage piping shall be any of the following:
 - 1. Hubless, cast-iron soil pipe and fittings; CISPI, hubless-piping couplings; and coupled joints.
 - 2. Solid-wall or Cellular-core PVC pipe, PVC socket fittings, and solvent-cemented joints.
 - 3. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.
- C. Underground storm drainage piping shall be any the following:
 - 1. Hubless, cast-iron soil pipe and fittings; heavy-duty, hubless-piping couplings; and coupled joints.
 - 2. Solid-wall or Cellular-core PVC pipe, PVC socket fittings, and solvent-cemented joints.
 - 3. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.

END OF SECTION 221413

SECTION 221423 - STORM DRAINAGE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof drains.
 - 2. Cleanouts.
 - 3. Flashing materials.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 ROOF DRAINS

- A. See Fixture Specifications schedule on plumbing drawings for roof drain and cleanout descriptions.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions.
 - 1. Install flashing collar or flange of roof drain to prevent leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.

2. Install expansion joints, if indicated, in roof drain outlets.
 3. Position roof drains for easy access and maintenance.
- B. Install downspout adapters on outlet of back-outlet parapet roof drains and connect to sheet metal downspouts.
- C. Install cleanouts in aboveground piping and building drain piping according to the following instructions unless otherwise indicated:
1. Use cleanouts the same size as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
 2. Locate cleanouts at each change in direction of piping greater than 45 degrees.
 3. Locate cleanouts at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
 4. Locate cleanouts at base of each vertical soil and waste stack.
- D. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- E. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
- F. Install horizontal backwater valves in floor with cover flush with floor.
- G. Install wall cleanouts in vertical conductors. Install access door in wall if indicated.
- H. Install through-penetration firestop assemblies in plastic conductors at concrete floor penetrations.
- I. Install sleeve flashing device with each conductor passing through floors with waterproof membrane.

3.2 CONNECTIONS

- A. Comply with requirements for piping specified in Section 221413 "Facility Storm Drainage Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

3.3 FLASHING INSTALLATION

- A. Fabricate flashing from single piece of metal unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
1. Lead Sheets: Burn joints of 6.0-lb/sq. ft. lead sheets, 0.0938-inch thickness or thicker. Solder joints of 4.0-lb/sq. ft. lead sheets, 0.0625-inch thickness or thinner.
 2. Copper Sheets: Solder joints of copper sheets.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching the pipe size, with a minimum length of 10 inches and with skirt or flange extending at least 8 inches around pipe.
2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.

- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.4 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221423

SECTION 223300 - ELECTRIC, DOMESTIC-WATER HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Commercial, light-duty, storage, electric, domestic-water heaters.
 - 2. Domestic-water heater accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type and size of domestic-water heater indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings:
 - 1. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of commercial, electric, domestic-water heater, from manufacturer.
- B. Domestic-Water Heater Labeling: Certified and labeled by testing agency acceptable to authorities having jurisdiction.
- C. Source quality-control reports.
- D. Field quality-control reports.
- E. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For electric, domestic-water heaters to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.
- C. ASME Compliance: Where ASME-code construction is indicated, fabricate and label commercial, domestic-water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
- D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61 Annex G, "Drinking Water System Components - Health Effects."

1.7 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of electric, domestic-water heaters that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including storage tank and supports.
 - b. Faulty operation of controls.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal use.
 - 2. Warranty Periods: From date of Substantial Completion.
 - a. Commercial, Light-Duty, Storage, Electric, Domestic-Water Heaters:
 - 1) Storage Tank: Three years.
 - 2) Controls and Other Components: Three years.
 - b. Compression Tanks: Five years.

PART 2 - PRODUCTS

- A. Commercial, Light-Duty, Storage, Electric, Domestic-Water Heaters:
 - 1. See Electric Water Heater Schedule on plumbing drawings for Electric Domestic-Water Heaters make, model number and description.

2.2 DOMESTIC-WATER HEATER ACCESSORIES

A. Domestic-Water Compression Tanks:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A.O. Smith Corporation.
 - b. AMTROL, Inc.
 - c. Flexcon Industries.
 - d. Honeywell.
 - e. Pentair Pump Group.
 - f. State Industries.
 - g. TACO Comfort Solutions, Inc.
2. Description: Steel pressure-rated tank constructed with welded joints and factory-installed butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.
3. Construction:
 - a. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.
 - b. Interior Finish: Comply with NSF 61 Annex G barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.
 - c. Air-Charging Valve: Factory installed.
4. Capacity and Characteristics:
 - a. Working-Pressure Rating: 100 psig.
 - b. Capacity Acceptable: 2 gal. and 4 gal. minimum or as scheduled on drawings.
 - c. Air Precharge Pressure: Precharge equal to static supply pressure.

B. Drain Pans: Corrosion-resistant metal with raised edge. Comply with ANSI/CSA LC 3. Include dimensions not less than base of domestic-water heater, and include drain outlet not less than NPS 3/4 with ASME B1.20.1 pipe threads or with ASME B1.20.7 garden-hose threads.

C. Piping-Type Heat Traps: Field-fabricated piping arrangement according to ASHRAE/IESNA 90.1.

D. Heat-Trap Fittings: ASHRAE 90.2.

E. Manifold Kits: Domestic-water heater manufacturer's factory-fabricated inlet and outlet piping for field installation, for multiple domestic-water heater installation. Include ball-type shutoff valves to isolate each domestic-water heater and calibrated balancing valves to provide balanced flow through each domestic-water heater.

1. Comply with requirements for ball-type shutoff valves specified in Section 220523.12 "Ball Valves for Plumbing Piping."
2. Comply with requirements for balancing valves specified in Section 221119 "Domestic Water Piping Specialties."

- F. Pressure-Reducing Valves: ASSE 1003 for water. Set at 25-psig- maximum outlet pressure unless otherwise indicated.
- G. Combination Temperature-and-Pressure Relief Valves: ASME rated and stamped. Include relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select relief valves with sensing element that extends into storage tank.
- H. Pressure Relief Valves: ASME rated and stamped. Include pressure setting less than domestic-water heater working-pressure rating.
- I. Vacuum Relief Valves: ANSI Z21.22/CSA 4.4.
- J. Shock Absorbers: ASSE 1010 or PDI-WH 201, Size A water hammer arrester.
- K. Domestic-Water Heater Stands: Manufacturer's factory-fabricated steel stand for floor mounting, capable of supporting domestic-water heater and water. Include dimension that will support bottom of domestic-water heater a minimum of 18 inches above the floor.
- L. Domestic-Water Heater Mounting Brackets: Manufacturer's factory-fabricated steel bracket for wall mounting, capable of supporting domestic-water heater and water.

2.3 SOURCE QUALITY CONTROL

- A. Factory Tests: Test and inspect domestic-water heaters specified to be ASME-code construction, according to ASME Boiler and Pressure Vessel Code.
- B. Hydrostatically test commercial domestic-water heaters to minimum of one and one-half times pressure rating before shipment.
- C. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 014000 "Quality Requirements" for retesting and reinspecting requirements and Section 017300 "Execution" for requirements for correcting the Work.
- D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 DOMESTIC-WATER HEATER INSTALLATION

- A. Commercial, Electric, Domestic-Water Heater Mounting: Install commercial, electric, domestic-water heaters on concrete base.
 - 1. Exception: Omit concrete bases for commercial, electric, domestic-water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.
 - 2. Maintain manufacturer's recommended clearances.
 - 3. Arrange units so controls and devices that require servicing are accessible.

4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 6. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 7. Install anchor bolts to elevations required for proper attachment to supported equipment.
 8. Anchor domestic-water heaters to substrate.
- B. Install electric, domestic-water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.
1. Install shutoff valves on domestic-water-supply piping to domestic-water heaters and on domestic-hot-water outlet piping. Comply with requirements for shutoff valves specified in Section 220523.12 "Ball Valves for Plumbing Piping."
- C. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.
- D. Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for electric, domestic-water heaters that do not have tank drains. Comply with requirements for hose-end drain valves specified in Section 221119 "Domestic Water Piping Specialties."
- E. Install thermometers on outlet piping of electric, domestic-water heaters. Comply with requirements for thermometers specified in Section 220519 "Meters and Gages for Plumbing Piping."
- F. Install thermometers on inlet and outlet piping of electric, domestic-water heaters. Comply with requirements for thermometers specified in Section 220519 "Meters and Gages for Plumbing Piping."
- G. Install piping-type heat traps on inlet and outlet piping of electric, domestic-water heater storage tanks without integral or fitting-type heat traps.
- H. Fill electric, domestic-water heaters with water.
- I. Charge domestic-water compression tanks with air.
- 3.2 CONNECTIONS
- A. Comply with requirements for piping specified in Section 221116 "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where installing piping adjacent to electric, domestic-water heaters, allow space for service and maintenance of water heaters. Arrange piping for easy removal of domestic-water heaters.

3.3 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
 - 2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 014000 "Quality Requirements" for retesting and reinspecting requirements and Section 017300 "Execution" for requirements for correcting the Work.
- C. Prepare test and inspection reports.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain commercial, electric, domestic-water heaters.

END OF SECTION 223300

SECTION 224213.13 - COMMERCIAL WATER CLOSETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Water closets.
 - 2. Toilet seats.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for water closets.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For water closets to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 FLOOR-MOUNTED, BOTTOM-OUTLET FLUSH TANK WATER CLOSETS

- A. See Fixture Specifications schedule on plumbing drawings for water closets make, model and description.

2.2 TOILET SEATS

- A. Toilet Seats:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Standard.

- b. Bemis Manufacturing Company.
 - c. Centoco Manufacturing Corporation.
 - d. Church Seats; Bemis Manufacturing Company.
 - e. Jones Stephens Corp.
 - f. Kohler Co.
 - g. Olsonite Seat Co.
 - h. Sanderson Plumbing Products, Inc.
 - i. Sperzel of Lexington.
 - j. TOTO USA, INC.
 - k. Zurn Industries LLC.
- 2. Standard: IAPMO/ANSI Z124.5.
 - 3. Material: Plastic.
 - 4. Type: Commercial (Heavy Duty).
 - 5. Shape: Elongated rim, open front.
 - 6. Hinge: Self-sustaining.
 - 7. Hinge Material: Noncorroding metal.
 - 8. Seat Cover: Not required.
 - 9. Color: White.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before water-closet installation.
- B. Examine walls and floors for suitable conditions where water closets will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Water-Closet Installation:
 - 1. Install level and plumb according to roughing-in drawings.
 - 2. Install floor-mounted water closets on bowl-to-drain connecting fitting attachments to piping or building substrate.
 - 3. Install accessible, wall-mounted water closets at mounting height for handicapped/elderly, according to ICC/ANSI A117.1.
- B. Flush Tank Lever Installation:
 - 1. Install flush tank angle supply stop valve, water-supply fitting on each supply to each water closet.
 - 2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
 - 3. Install flush tank lever-handle for accessible water closets with handle located on open side of water closet.

- C. Install toilet seats on water closets.
- D. Wall Flange and Escutcheon Installation:
 - 1. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations and within cabinets and millwork.
 - 2. Install deep-pattern escutcheons if required to conceal protruding fittings.
 - 3. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."
- E. Joint Sealing:
 - 1. Seal joints between water closets and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
 - 2. Match sealant color to water-closet color.
 - 3. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

3.3 CONNECTIONS

- A. Connect water closets with water supplies and soil, waste, and vent piping. Use size fittings required to match water closets.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."
- D. Where installing piping adjacent to water closets, allow space for service and maintenance.

3.4 ADJUSTING

- A. Operate and adjust water closets and controls. Replace damaged and malfunctioning water closets, fittings, and controls.
- B. Adjust water pressure at flushometer valves to produce proper flow.

3.5 CLEANING AND PROTECTION

- A. Clean water closets and fittings with manufacturers' recommended cleaning methods and materials.
- B. Install protective covering for installed water closets and fittings.
- C. Do not allow use of water closets for temporary facilities unless approved in writing by Owner.

END OF SECTION 224213.13

SECTION 224213.16 - COMMERCIAL URINALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Urinals.
 - 2. Flushometer valves.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for urinals.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For urinals and flushometer valves to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 WALL-HUNG URINALS

- A. See Fixture Specifications schedule on plumbing drawings for urinals make, model and description.

2.2 URINAL FLUSHOMETER VALVES

- A. Lever-Handle, Piston Flushometer Valves:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Standard.

- b. Delany Products.
 - c. Kohler Co.
 - d. Sloan Valve Company.
 - e. TOTO USA, INC.
 - f. Zurn Industries, LLC.
- 2. Standard: ASSE 1037.
 - 3. Minimum Pressure Rating: 125 psig.
 - 4. Features: Include integral check stop and backflow-prevention device.
 - 5. Material: Brass body with corrosion-resistant components.
 - 6. Exposed Flushometer-Valve Finish: Chrome plated.
 - 7. Panel Finish: Chrome plated or stainless steel.
 - 8. Style: Exposed.
 - 9. Consumption: 0.5 gal. per flush.
 - 10. Minimum Inlet: NPS 3/4.
 - 11. Minimum Outlet: NPS 3/4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before urinal installation.
- B. Examine walls and floors for suitable conditions where urinals will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Urinal Installation:
 - 1. Install urinals level and plumb according to roughing-in drawings.
 - 2. Install wall-hung, back-outlet urinals onto waste fitting seals and attached to supports.
 - 3. Install accessible, wall-mounted urinals at mounting height for the handicapped/elderly, according to ICC/ANSI A117.1.
- B. Support Installation:
 - 1. Install supports, affixed to building substrate, for wall-hung urinals.
 - 2. Use off-floor carriers with waste fitting and seal for back-outlet urinals.
 - 3. Use carriers without waste fitting for urinals with tubular waste piping.
 - 4. Use chair-type carrier supports with rectangular steel uprights for accessible urinals.
- C. Flushometer-Valve Installation:
 - 1. Install flushometer-valve water-supply fitting on each supply to each urinal.
 - 2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.

3. Install lever-handle flushometer valves for accessible urinals with handle mounted on open side of compartment.

D. Wall Flange and Escutcheon Installation:

1. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations.
2. Install deep-pattern escutcheons if required to conceal protruding fittings.
3. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."

E. Joint Sealing:

1. Seal joints between urinals and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
2. Match sealant color to urinal color.
3. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

3.3 CONNECTIONS

- A. Connect urinals with water supplies and soil, waste, and vent piping. Use size fittings required to match urinals.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."
- D. Where installing piping adjacent to urinals, allow space for service and maintenance.

3.4 ADJUSTING

- A. Operate and adjust urinals and controls. Replace damaged and malfunctioning urinals, fittings, and controls.
- B. Adjust water pressure at flushometer valves to produce proper flow.

3.5 CLEANING AND PROTECTION

- A. Clean urinals and fittings with manufacturers' recommended cleaning methods and materials.
- B. Install protective covering for installed urinals and fittings.
- C. Do not allow use of urinals for temporary facilities unless approved in writing by Owner.

END OF SECTION 224213.16

SECTION 224216.13 - COMMERCIAL LAVATORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Lavatories.
 - 2. Supply fittings.
 - 3. Waste fittings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for lavatories.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Counter cutout templates for mounting of counter-mounted lavatories.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For lavatories and faucets to include in operation and maintenance manuals.
 - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Servicing and adjustments of automatic faucets.

PART 2 - PRODUCTS

2.1 COMMERCIAL LAVATORIES

- A. See Fixture Specifications schedule on plumbing drawings for lavatory type, make, model and description.

2.2 SUPPLY FITTINGS

- A. NSF Standard: Comply with NSF/ANSI 61 Annex G, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.
- B. Standard: ASME A112.18.1/CSA B125.1.
- C. Supply Piping: Chrome-plated-brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated-brass or stainless-steel wall flange.
- D. Supply Stops: Chrome-plated-brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
- E. Operation: Loose key.
- F. Risers:
 - 1. NPS 3/8.
 - 2. ASME A112.18.6, braided- or corrugated-stainless-steel, flexible hose riser.

2.3 WASTE FITTINGS

- A. Standard: ASME A112.18.2/CSA B125.2.
- B. Drain: Grid type with NPS 1-1/4 offset and straight tailpiece.
- C. Trap:
 - 1. Size: NPS 1-1/2 by NPS 1-1/4.
 - 2. Material: Chrome-plated, two-piece, cast-brass trap and swivel elbow with 0.032-inch-thick brass tube to wall; and chrome-plated, brass or steel wall flange.
 - 3. Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch-thick stainless-steel tube to wall; and stainless-steel wall flange.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before lavatory installation.

- B. Examine counters and walls for suitable conditions where lavatories will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install lavatories level and plumb according to roughing-in drawings.
- B. Install supports, affixed to building substrate, for wall-mounted lavatories.
- C. Install accessible wall-mounted lavatories at handicapped/elderly mounting height for people with disabilities or the elderly, according to ICC/ANSI A117.1.
- D. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."
- E. Seal joints between lavatories, counters, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."
- F. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible lavatories. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

3.3 CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

- A. Operate and adjust lavatories and controls. Replace damaged and malfunctioning lavatories, fittings, and controls.
- B. Adjust water pressure at faucets to produce proper flow.

3.5 CLEANING AND PROTECTION

- A. After completing installation of lavatories, inspect and repair damaged finishes.
- B. Clean lavatories, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.

- C. Provide protective covering for installed lavatories and fittings.
- D. Do not allow use of lavatories for temporary facilities unless approved in writing by Owner.

END OF SECTION 224216.13

SECTION 224216.16 - COMMERCIAL SINKS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Sinks.
2. Service Sinks.
3. Supply fittings.
4. Waste fittings.
5. Grout.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for sinks.
 2. Include rated capacities, operating characteristics and furnished specialties and accessories.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Counter cutout templates for mounting of counter-mounted lavatories.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sinks to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 COMMERCIAL SINKS

- A. See Fixture Specifications schedule on plumbing drawings for sink type, make, model and description.

2.2 SERVICE SINKS

- A. See Fixture Specifications schedule on plumbing drawings for service sink make, model and description.

2.3 SUPPLY FITTINGS

- A. NSF Standard: Comply with NSF/ANSI 61 Annex G, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.
- B. Standard: ASME A112.18.1/CSA B125.1.
- C. Supply Piping: Chrome-plated brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated brass or stainless-steel wall flange.
- D. Supply Stops: Chrome-plated brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
- E. Operation: Loose key.
- F. Risers:
 - 1. NPS 1/2
 - 2. ASME A112.18.6, braided or corrugated stainless-steel flexible hose.

2.4 WASTE FITTINGS

- A. Standard: ASME A112.18.2/CSA B125.2.
- B. Drain: Grid type with NPS 1-1/2 offset and straight tailpiece.
- C. Trap:
 - 1. Size: NPS 1-1/2.
 - 2. Material: Chrome-plated, two-piece, cast-brass trap and swivel elbow with 0.032-inch-thick brass tube to wall; and chrome-plated brass or steel wall flange.
 - 3. Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch-thick stainless-steel tube to wall; and stainless-steel wall flange.

2.5 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before sink installation.
- B. Examine walls, floors, and counters for suitable conditions where sinks will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install sinks level and plumb according to roughing-in drawings.
- B. Install supports, affixed to building substrate, for wall-hung sinks.
- C. Install accessible wall-mounted sinks at handicapped/elderly mounting height according to ICC/ANSI A117.1.
- D. Set floor-mounted sinks in leveling bed of cement grout.
- E. Install water-supply piping with stop on each supply to each sink faucet.
 - 1. Exception: Use ball valves if supply stops are not specified with sink. Comply with valve requirements specified in Section 220523.12 "Ball Valves for Plumbing Piping".
 - 2. Install stops in locations where they can be easily reached for operation.
- F. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."
- G. Seal joints between sinks and counters, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."
- H. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

3.3 CONNECTIONS

- A. Connect sinks with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

- A. Operate and adjust sinks and controls. Replace damaged and malfunctioning sinks, fittings, and controls.
- B. Adjust water pressure at faucets to produce proper flow.

3.5 CLEANING AND PROTECTION

- A. After completing installation of sinks, inspect and repair damaged finishes.
- B. Clean sinks, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
- C. Provide protective covering for installed sinks and fittings.
- D. Do not allow use of sinks for temporary facilities unless approved in writing by Owner.

END OF SECTION 224216.16

SECTION 224223 - COMMERCIAL SHOWERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Showers.
 - 2. Shower faucets.
 - 3. Grout.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for showers.
 - 2. Include rated capacities, operating characteristics, and furnished specialties and accessories.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For shower faucets to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 COMMERCIAL SHOWERS

- A. See Fixture Specifications schedule on plumbing drawings for shower make, model and description.
- B. Coordinate shower construction type with architectural drawings.

2.2 SHOWER FAUCETS

- A. NSF Standard: Comply with NSF 61 Annex G, "Drinking Water System Components - Health Effects," for shower materials that will be in contact with potable water.

- B. See Fixture Specifications schedule on plumbing drawings for shower faucet make, model and description.

2.3 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water-supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before shower installation.
- B. Examine walls and floors for suitable conditions where showers will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Assemble shower components according to manufacturers' written instructions.
- B. Install showers level and plumb according to roughing-in drawings.
- C. Install water-supply piping with stop on each supply to each shower faucet.
 - 1. Exception: Use ball valves if supply stops are not specified with shower. Comply with valve requirements specified in Section 220523.12 "Ball Valves for Plumbing Piping."
 - 2. Install stops in locations where they can be easily reached for operation.
- D. Install shower flow-control fittings with specified maximum flow rates in shower arms.
- E. Set shower receptors in leveling bed of cement grout.
- F. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheons requirements specified in Section 220518 "Escutcheons for Plumbing Piping."
- G. Seal joints between showers and floors and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

3.3 CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with traps and soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

- A. Operate and adjust showers and controls. Replace damaged and malfunctioning showers, fittings, and controls.
- B. Adjust water pressure at faucets to produce proper flow.

3.5 CLEANING AND PROTECTION

- A. After completing installation of showers, inspect and repair damaged finishes.
- B. Clean showers, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
- C. Provide protective covering for installed fixtures and fittings.
- D. Do not allow use of showers for temporary facilities unless approved in writing by Owner.

END OF SECTION 224223

SECTION 224716 - PRESSURE WATER COOLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes pressure water coolers and related components.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of pressure water cooler.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: Include diagrams for power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For pressure water coolers to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 PRESSURE WATER COOLERS

- A. See Fixture Specifications schedule on plumbing drawings for pressure water cooler make, model and description.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for water-supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before fixture installation.

- B. Examine walls and floors for suitable conditions where fixtures will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install fixtures level and plumb according to roughing-in drawings. For fixtures indicated for children, install at height required by authorities having jurisdiction.
- B. Set freestanding pressure water coolers on floor.
- C. Install off-the-floor carrier supports, affixed to building substrate, for wall-mounted fixtures.
- D. Install mounting frames, affixed to building construction, and attach recessed, pressure water coolers to mounting frames.
- E. Install water-supply piping with shutoff valve on supply to each fixture to be connected to domestic-water distribution piping. Use ball valve. Install valves in locations where they can be easily reached for operation. Valves are specified in Section 220523.12 "Ball Valves for Plumbing Piping."
- F. Install trap and waste piping on drain outlet of each fixture to be connected to sanitary drainage system.
- G. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons where required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."
- H. Seal joints between fixtures and walls using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

3.3 CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Install ball shutoff valve on water supply to each fixture or upstream from filter for water cooler. Comply with valve requirements specified in Section 220523.12 "Ball Valves for Plumbing Piping."
- D. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

- A. Adjust fixture flow regulators for proper flow and stream height.

- B. Adjust pressure water-cooler temperature settings.

3.5 CLEANING

- A. After installing fixture, inspect unit. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.
- B. Clean fixtures, on completion of installation, according to manufacturer's written instructions.
- C. Provide protective covering for installed fixtures.
- D. Do not allow use of fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 224716

SECTION 230130.51 - HVAC AIR-DISTRIBUTION SYSTEM CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cleaning HVAC air-distribution equipment, ducts, plenums, and system components.

1.3 DEFINITIONS

- A. ASCS: Air systems cleaning specialist.
- B. NADCA: National Air Duct Cleaners Association.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For an ASCS.
- B. Strategies and procedures plan.
- C. Cleanliness verification report.

1.5 QUALITY ASSURANCE

- A. ASCS Qualifications: A certified member of NADCA.
 - 1. Supervisor Qualifications: Certified as an ASCS by NADCA.
- B. UL Compliance: Comply with UL 181 and UL 181A for fibrous-glass ducts.
- C. Cleaning Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to HVAC air-distribution system cleaning including, but not limited to, review of the cleaning strategies and procedures plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine HVAC air-distribution equipment, ducts, plenums, and system components to determine appropriate methods, tools, and equipment required for performance of the Work.
- B. Perform "Project Evaluation and Recommendation" according to NADCA ACR 2006.
- C. Prepare written report listing conditions detrimental to performance of the Work.
- D. Proceed with work only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare a written plan that includes strategies and step-by-step procedures. At a minimum, include the following:
 - 1. Supervisor contact information.
 - 2. Work schedule including location, times, and impact on occupied areas.
 - 3. Methods and materials planned for each HVAC component type.
 - 4. Required support from other trades.
 - 5. Equipment and material storage requirements.
 - 6. Exhaust equipment setup locations.
- B. Use the existing service openings, as required for proper cleaning, at various points of the HVAC system for physical and mechanical entry and for inspection.
- C. Comply with NADCA ACR 2006, "Guidelines for Constructing Service Openings in HVAC Systems" Section.

3.3 CLEANING

- A. Comply with NADCA ACR 2006.
- B. Remove visible surface contaminants and deposits from within the HVAC system.
- C. Systems and Components to Be Cleaned:
 - 1. Air devices for supply and return air.
 - 2. Ductwork:
 - a. Supply-air ducts, including turning vanes and reheat coils, to the air-handling unit.
 - b. Return-air ducts to the air-handling unit.
 - c. Exhaust-air ducts.

3. Air-Handling Units:
 - a. Interior surfaces of the unit casing.
 - b. Coil surfaces compartment.
 - c. Condensate drain pans.
 - d. Fans, fan blades, and fan housings.
4. Filters and filter housings.
- D. Collect debris removed during cleaning. Ensure that debris is not dispersed outside the HVAC system during the cleaning process.
- E. Particulate Collection:
 1. For particulate collection equipment, include adequate filtration to contain debris removed. Locate equipment downwind and away from all air intakes and other points of entry into the building.
- F. Control odors and mist vapors during the cleaning and restoration process.
- G. Mark the position of manual volume dampers and air-directional mechanical devices inside the system prior to cleaning. Restore them to their marked position on completion of cleaning.
- H. System components shall be cleaned so that all HVAC system components are visibly clean. On completion, all components must be returned to those settings recorded just prior to cleaning operations.
- I. Clean all air-distribution devices, registers, grilles, and diffusers.
- J. Clean visible surface contamination deposits according to NADCA ACR 2006 and the following:
 1. Clean air-handling units, airstream surfaces, components, condensate collectors, and drains.
 2. Ensure that a suitable operative drainage system is in place prior to beginning wash-down procedures.
 3. Clean evaporator coils, reheat coils, and other airstream components.
- K. Duct Systems:
 1. Mechanically clean duct systems specified to remove all visible contaminants so that the systems are capable of passing the HVAC System Cleanliness Tests (see NADCA ACR 2006).
- L. Debris removed from the HVAC system shall be disposed of according to applicable Federal, state, and local requirements.
- M. Mechanical Cleaning Methodology:
 1. Source-Removal Cleaning Methods: The HVAC system shall be cleaned using source-removal mechanical cleaning methods designed to extract contaminants from within the HVAC system and to safely remove these contaminants from the facility. No cleaning

method, or combination of methods, shall be used that could potentially damage components of the HVAC system or negatively alter the integrity of the system.

- a. Use continuously operating vacuum-collection devices to keep each section being cleaned under negative pressure.
 - b. Cleaning methods that require mechanical agitation devices to dislodge debris that is adhered to interior surfaces of HVAC system components shall be equipped to safely remove these devices. Cleaning methods shall not damage the integrity of HVAC system components or damage porous surface materials such as duct and plenum liners.
2. Cleaning Mineral-Fiber Insulation Components:
 - a. Cleaning methods used shall not cause damage to fibrous-glass components and will render the system capable of passing the HVAC System Cleanliness Tests (see NADCA ACR 2006).
 - b. Fibrous materials that become wet shall be discarded and replaced.

N. Coil Cleaning:

1. Measure static-pressure differential across each coil.
2. See NADCA ACR 2006, "Coil Surface Cleaning" Section. Type 1, or Type 1 and Type 2, cleaning methods shall be used to render the coil visibly clean and capable of passing Coil Cleaning Verification (see applicable NADCA ACR 2006).
3. Coil drain pans shall be subject to NADCA ACR 2006, "Non-Porous Surfaces Cleaning Verification." Ensure that condensate drain pans are operational.
4. Electric-resistance coils shall be de-energized, locked out, and tagged before cleaning.
5. Cleaning methods shall not cause any appreciable damage to, cause displacement of, inhibit heat transfer, or cause erosion of the coil surface or fins, and shall comply with coil manufacturer's written recommendations when available.
6. Rinse thoroughly with clean water to remove any latent residues.

3.4 CLEANLINESS VERIFICATION

- A. Verify cleanliness according to NADCA ACR 2006, "Verification of HVAC System Cleanliness" Section.
- B. Perform visual inspection for cleanliness. If no contaminants are evident through visual inspection, the HVAC system shall be considered clean. If visible contaminants are evident through visual inspection, those portions of the system where contaminants are visible shall be re-cleaned and subjected to re-inspection for cleanliness.
- C. Verification of Coil Cleaning:
 1. Measure static-pressure differential across each coil.
 2. Coil will be considered clean if cleaning restored the coil static-pressure differential within 10 percent of the differential measured when the coil was first installed.
 3. Coil will be considered clean if the coil is free of foreign matter and chemical residue, based on a thorough visual inspection.
- D. Prepare a written cleanliness verification report. At a minimum, include the following:

1. Written documentation of the success of the cleaning.
 2. Site inspection reports, initialed by supervisor, including notation on areas of inspection, as verified through visual inspection.
 3. System areas found to be damaged.
- E. Photographic Documentation: Comply with requirements in Section 013233 "Photographic Documentation."

3.5 RESTORATION

- A. Restore and repair HVAC air-distribution equipment, ducts, plenums, and components according to NADCA ACR 2006, "Restoration and Repair of Mechanical Systems" Section.
- B. Restore service openings capable of future reopening. Comply with requirements in Section 233113 "Metal Ducts." Include location of service openings in Project closeout report.
- C. Replace fibrous-glass materials that cannot be restored by cleaning or resurfacing. Comply with requirements in Section 233113 "Metal Ducts" and Section 233116 "Nonmetal Ducts."
- D. Replace damaged insulation according to Section 230713 "Duct Insulation."
- E. Ensure that closures do not hinder or alter airflow.
- F. New closure materials, including insulation, shall match opened materials and shall have removable closure panels fitted with gaskets and fasteners.
- G. Reseal fibrous-glass ducts. Comply with requirements in Section 233116 "Nonmetal Ducts."

END OF SECTION 230130.51

SECTION 230513 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.3 COORDINATION

- A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
 - 1. Motor controllers.
 - 2. Torque, speed, and horsepower requirements of the load.
 - 3. Ratings and characteristics of supply circuit and required control sequence.
 - 4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

- A. Comply with NEMA MG 1 unless otherwise indicated.
- B. Comply with IEEE 841 for severe-duty motors.

2.2 MOTOR CHARACTERISTICS

- A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.
- B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

- A. Description: NEMA MG 1, Design B, medium induction motor.
- B. Efficiency: Energy efficient, as defined in NEMA MG 1.
- C. Service Factor: 1.15.
- D. Multispeed Motors: Variable torque.
 - 1. For motors with 2:1 speed ratio, consequent pole, single winding.
 - 2. For motors with other than 2:1 speed ratio, separate winding for each speed.
- E. Multispeed Motors: Separate winding for each speed.
- F. Rotor: Random-wound, squirrel cage.
- G. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
- H. Temperature Rise: Match insulation rating.
- I. Insulation: Class F.
- J. Code Letter Designation:
 - 1. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.
- K. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

- A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
- B. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
 - 1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
 - 2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
 - 3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
 - 4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.
- C. Severe-Duty Motors: Comply with IEEE 841, with 1.15 minimum service factor.

2.5 SINGLE-PHASE MOTORS

- A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
 - 1. Permanent-split capacitor.
 - 2. Split phase.
 - 3. Capacitor start, inductor run.
 - 4. Capacitor start, capacitor run.
- B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
- C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
- D. Motors 1/20 HP and Smaller: Shaded-pole type.
- E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 230513

SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Stack-sleeve fittings.
 - 3. Sleeve-seal systems.
 - 4. Sleeve-seal fittings.
 - 5. Grout.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.
- C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
- D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

2.2 STACK-SLEEVE FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Jay R. Smith Mfg Co; a division of Morris Group International.
 2. Zurn Industries, LLC.
- B. Description: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring, bolts, and nuts for membrane flashing.
1. Underdeck Clamp: Clamping ring with setscrews.

2.3 SLEEVE-SEAL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Products and Systems, Inc.
 2. Airex Manufacturing.
 3. CALPICO, Inc.
 4. GPT; an EnPro Industries Company.
 5. Metraflex Company (The).
 6. Proco Products, Inc.
- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 2. Pressure Plates: Carbon steel.
 3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.4 SLEEVE-SEAL FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Products and Systems, Inc.
 2. CALPICO, Inc.
 3. GPT; an EnPro Industries Company.
 4. Metraflex Company (The).
 5. Proco Products, Inc.

- B. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall. Unit has plastic or rubber waterstop collar with center opening to match piping OD.

2.5 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
 - 1. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 - 1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
 - 2. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
 - 3. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 079200 "Joint Sealants."
- E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.2 STACK-SLEEVE-FITTING INSTALLATION

- A. Install stack-sleeve fittings in new slabs as slabs are constructed.
 - 1. Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 2. Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing. Comply with requirements for flashing specified in Section 076200 "Sheet Metal Flashing and Trim."
 - 3. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
 - 4. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
 - 5. Using grout, seal the space around outside of stack-sleeve fittings.
- B. Fire-Barrier Penetrations: Maintain indicated fire rating of floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.3 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.4 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

3.5 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
 - 1. Exterior Concrete Walls above Grade:
 - a. Piping Smaller Than NPS 6: Sleeve-seal fittings.
 - b. Piping NPS 6 and Larger: Galvanized-steel wall sleeves.
 - 2. Concrete Slabs-on-Grade:

- a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
 - b. Piping NPS 6 and Larger: Galvanized-steel-pipe sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
3. Concrete Slabs above Grade:
- a. Piping Smaller Than NPS 6: PVC-pipe sleeves.
 - b. Piping NPS 6 and Larger: Stack-sleeve fittings.
4. Interior Partitions:
- a. Piping Smaller Than NPS 6: PVC-pipe sleeves.
 - b. Piping NPS 6 and Larger: Galvanized-steel-sheet sleeves.

END OF SECTION 230517

SECTION 230518 - ESCUTCHEONS FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.
 - 2. Floor plates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
- C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.
- D. Split-Plate, Stamped-Steel Type: With chrome-plated finish, concealed hinge, and spring-clip fasteners.

2.2 FLOOR PLATES

- A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
- B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass with polished, chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - g. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - h. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - i. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - j. Bare Piping in Equipment Rooms: One-piece, cast-brass type with polished, chrome-plated finish.
 - k. Bare Piping in Equipment Rooms: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. New Piping: One-piece, floor-plate type.

3.2 FIELD QUALITY CONTROL

- A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 230518

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Thermal-hanger shield inserts.
5. Fastener systems.
6. Pipe stands.
7. Equipment supports.

- B. Related Sections:

1. Section 055000 "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
2. Section 230516 "Expansion Fittings and Loops for HVAC Piping" for pipe guides and anchors.
3. Section 233113 "Metal Ducts" and Section 233116 "Nonmetal Ducts" for duct hangers and supports.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
 1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following; include Product Data for components:
 1. Trapeze pipe hangers.
 2. Metal framing systems.
 3. Pipe stands.
 4. Equipment supports.
- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Detail fabrication and assembly of trapeze hangers.
 2. Design Calculations: Calculate requirements for designing trapeze hangers.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.7 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
 4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
 5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

B. Stainless-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.

2.2 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to the following:
 - a. B-line, an Eaton business.
 - b. Flex-Strut Inc.
 - c. G-Strut.
 - d. Haydon Corporation.
 - e. MIRO Industries.
 - f. Thomas & Betts Corporation; A Member of the ABB Group.
 - g. Unistrut; Part of Atkore International.
 - h. Wesanco, Inc.
2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
3. Standard: MFMA-4.
4. Channels: Continuous slotted steel channel with inturned lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
7. Metallic Coating: Hot-dipped galvanized.
8. Paint Coating: Epoxy.
9. Plastic Coating: PVC or Polyurethane or Epoxy.

B. Non-MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. CADDY; a brand of nVent.
 - c. Carpenter & Paterson, Inc.
 - d. Empire Industries, Inc
 - e. Gripple Inc.
 - f. MIRO Industries.
 - g. PHD Manufacturing, Inc.
 - h. RectorSeal HVAC; a CSW Industrials Company.
 - i. Rooftop Support Systems, a division of Eberl Iron Works, Inc.
2. Description: Shop- or field-fabricated pipe-support assembly made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
3. Standard: Comply with MFMA-4.
4. Channels: Continuous slotted steel channel with inturned lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
7. Coating: Zinc or PVC.

2.4 THERMAL-HANGER SHIELD INSERTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Buckaroos, Inc.
 2. CADDY; a brand of nVent.
 3. Carpenter & Paterson, Inc.
 4. KB Enterprise.
 5. National Pipe Hanger Corporation.
 6. Pipe Shields Inc.
 7. Piping Technology & Products, Inc.
 8. Rilco Manufacturing Co., Inc.
 9. Value Engineered Products, Inc.
- B. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength and vapor barrier.
- C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.5 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: Insert-wedge-type, stainless-steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.6 PIPE STANDS

- A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
- B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
- C. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.
- D. High-Type, Single-Pipe Stand:
 - 1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
 - 2. Base: Stainless steel.
 - 3. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous-thread rods.
 - 4. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless-steel, roller-type pipe support.
- E. High-Type, Multiple-Pipe Stand:
 - 1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
 - 2. Bases: One or more; plastic.
 - 3. Vertical Members: Two or more protective-coated-steel channels.
 - 4. Horizontal Member: Protective-coated-steel channel.
 - 5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.
- F. Curb-Mounted-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.7 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.8 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 - 2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.
- D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- E. Fastener System Installation:
 - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- F. Pipe Stand Installation:
 - 1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
 - 2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. See Section 077200 "Roof Accessories" for curbs.
- G. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

- H. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- I. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- J. Install lateral bracing with pipe hangers and supports to prevent swaying.
- K. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- L. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- M. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- N. Insulated Piping:
 - 1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 - 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - 5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports, metal trapeze pipe hangers, and metal framing systems and attachments for general service applications.
- F. Use stainless-steel pipe hanger and stainless-steel or corrosion-resistant attachments for hostile environment applications.
- G. Use copper-plated pipe hangers and copper or stainless-steel attachments for copper piping and tubing.
- H. Use padded hangers for piping that is subject to scratching.
- I. Use thermal-hanger shield inserts for insulated piping and tubing.
- J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
 - 2. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
 - 3. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.
 - 4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 - 5. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 - 6. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 - 7. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
 - 8. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
- K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 2. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 3. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 4. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- M. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction, to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 6. C-Clamps (MSS Type 23): For structural shapes.
 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- N. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- O. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- P. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- Q. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION 230529

SECTION 230548.13 - VIBRATION CONTROLS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Elastomeric isolation pads.
 - 2. Elastomeric hangers.
 - 3. Restrained isolation roof-curb rails.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
 - 2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of vibration isolation device type required.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show coordination of vibration isolation device installation for HVAC piping and equipment with other systems and equipment in the vicinity, including other supports and restraints, if any.
- B. Qualification Data: For testing agency.

PART 2 - PRODUCTS

2.1 ELASTOMERIC ISOLATION PADS

- A. Elastomeric Isolation Pads:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ace Mountings Co., Inc.
 - b. CADDY; a brand of nVent.

- c. California Dynamics Corporation.
 - d. Isolation Technology, Inc.
 - e. Kinetics Noise Control, Inc.
 - f. Korfund.
 - g. Mason Industries, Inc.
 - h. Novia; A Division of C&P.
 - i. Vibration Eliminator Co., Inc.
 - j. Vibration Isolation.
 - k. Vibration Management Corp.
 - l. Vibration Mountings & Controls, Inc.
2. Fabrication: Single or multiple layers of sufficient durometer stiffness for uniform loading over pad area.
 3. Size: Factory or field cut to match requirements of supported equipment.
 4. Pad Material: Oil and water resistant with elastomeric properties.
 5. Surface Pattern: Ribbed or Waffle pattern.
 6. Infused nonwoven cotton or synthetic fibers.
 7. Load-bearing metal plates adhered to pads.
 8. Sandwich-Core Material: Resilient and elastomeric.
 - a. Surface Pattern: Ribbed or Waffle pattern.
 - b. Infused nonwoven cotton or synthetic fibers.

2.2 ELASTOMERIC HANGERS

A. Elastomeric Mount in a Steel Frame with Upper and Lower Steel Hanger Rods:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ace Mountings Co., Inc.
 - b. CADDY; a brand of nVent.
 - c. California Dynamics Corporation.
 - d. Kinetics Noise Control, Inc.
 - e. Mason Industries, Inc.
 - f. Novia; A Division of C&P.
 - g. Vibration Eliminator Co., Inc.
 - h. Vibration Isolation.
 - i. Vibration Management Corp.
 - j. Vibration Mountings & Controls, Inc.
2. Frame: Steel, fabricated with a connection for an upper threaded hanger rod and an opening on the underside to allow for a maximum of 30 degrees of angular lower hanger-rod misalignment without binding or reducing isolation efficiency.
3. Dampening Element: Molded, oil-resistant rubber, neoprene, or other elastomeric material with a projecting bushing for the underside opening preventing steel to steel contact.

2.3 RESTRAINED ISOLATION ROOF-CURB RAILS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CADDY; a brand of nVent.
 - 2. California Dynamics Corporation.
 - 3. Kinetics Noise Control, Inc.
 - 4. Novia; A Division of C&P.
 - 5. Thybar Corporation.
 - 6. Vibration Eliminator Co., Inc.
 - 7. Vibration Management Corp.
 - 8. Vibration Mountings & Controls, Inc.
- B. Description: Factory-assembled, fully enclosed, insulated, air- and watertight curb rail designed to resiliently support equipment.
- C. Upper Frame: Upper frame shall provide continuous and captive support for equipment.
- D. Lower Support Assembly: The lower support assembly shall be formed sheet metal section containing adjustable and removable steel springs that support upper frame. The lower support assembly shall have a means for attaching to building structure and a wood nailer for attaching roof materials and shall be insulated with a minimum of 2 inches of rigid glass-fiber insulation on inside of assembly. Adjustable, restrained-spring isolators shall be mounted on elastomeric vibration isolation pads and shall have access ports, for level adjustment, with removable waterproof covers at all isolator locations. Isolators shall be located so they are accessible for adjustment at any time during the life of the installation without interfering with the integrity of the roof.
- E. Snubber Bushings: All-directional, elastomeric snubber bushings at least 1/4 inch thick.
- F. Water Seal: Galvanized sheet metal with EPDM seals at corners, attached to upper support frame, extending down past wood nailer of lower support assembly, and counterflashed over roof materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 VIBRATION CONTROL DEVICE INSTALLATION

- A. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.

END OF SECTION 230548.13

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment labels.
 - 2. Warning signs and labels.
 - 3. Pipe labels.
 - 4. Duct labels.
 - 5. Stencils.
 - 6. Valve tags.
 - 7. Warning tags.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve numbering scheme.
- E. Valve Schedules: For each piping system to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Plastic Labels for Equipment:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Brimar Industries, Inc.

- c. Carlton Industries, LP.
 - d. Champion America.
 - e. Craftmark Pipe Markers.
 - f. emedco.
 - g. Kolbi Pipe Marker Co.
 - h. LEM Products Inc.
 - i. Marking Services, Inc.
 - j. Seton Identification Products, a Brady Corporation Company.
2. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
 3. Letter Color: White.
 4. Background Color: Black.
 5. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
 6. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 7. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
 8. Fasteners: Stainless-steel self-tapping screws.
 9. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.
- C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number, and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.
 4. Champion America.
 5. Craftmark Pipe Markers.
 6. emedco.
 7. LEM Products Inc.
 8. Marking Services, Inc.
 9. National Marker Company.
 10. Seton Identification Products, a Brady Corporation Company.
 11. Stranco, Inc.

- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- C. Letter Color: White.
- D. Background Color: Red.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- H. Fasteners: Stainless-steel self-tapping screws.
- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- J. Label Content: Include caution and warning information plus emergency notification instructions.

2.3 PIPE LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Actioncraft Products, Inc; a division of Industrial Test Equipment Co., Inc.
 - 2. Brady Corporation.
 - 3. Brimar Industries, Inc.
 - 4. Carlton Industries, LP.
 - 5. Champion America.
 - 6. Craftmark Pipe Markers.
 - 7. emedco.
 - 8. Kolbi Pipe Marker Co.
 - 9. LEM Products Inc.
 - 10. Marking Services, Inc.
 - 11. Seton Identification Products, a Brady Corporation Company.
- B. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction according to ASME A13.1.
- C. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.
- D. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- E. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
2. Lettering Size: Size letters according to ASME A13.1 for piping.

2.4 DUCT LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.
 4. Champion America.
 5. Craftmark Pipe Markers.
 6. emedco.
 7. Kolbi Pipe Marker Co.
 8. LEM Products Inc.
 9. Marking Services, Inc.
 10. Seton Identification Products, a Brady Corporation Company.
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- C. Letter Color: White.
- D. Background Color: Black.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- H. Fasteners: Stainless-steel self-tapping screws.
- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- J. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings; also include duct size and an arrow indicating flow direction.
 1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions or as separate unit on each duct label to indicate flow direction.

2.5 STENCILS

- A. Stencils for Piping:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brimar Industries, Inc.
 - b. Carlton Industries, LP.
 - c. Champion America.
 - d. Craftmark Pipe Markers.
 - e. Kolbi Pipe Marker Co.
 - f. Marking Services, Inc.
2. Lettering Size: Size letters according to ASME A13.1 for piping.
3. Stencil Material: Fiberboard or metal.
4. Stencil Paint: Exterior, gloss, acrylic enamel in colors complying with recommendations in ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.
5. Identification Paint: Exterior, acrylic enamel in colors according to ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.

2.6 VALVE TAGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Actioncraft Products, Inc; a division of Industrial Test Equipment Co., Inc.
 2. Brady Corporation.
 3. Brimar Industries, Inc.
 4. Carlton Industries, LP.
 5. Champion America.
 6. Craftmark Pipe Markers.
 7. emedco.
 8. Kolbi Pipe Marker Co.
 9. LEM Products Inc.
 10. Marking Services, Inc.
 11. Seton Identification Products, a Brady Corporation Company.
- B. Description: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
 1. Tag Material: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 2. Fasteners: Brass wire-link chain or beaded chain or S-hook.
- C. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
 1. Valve-tag schedule shall be included in operation and maintenance data.

2.7 WARNING TAGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.
 4. Champion America.
 5. Craftmark Pipe Markers.
 6. emedco.
 7. Kolbi Pipe Marker Co.
 8. LEM Products Inc.
 9. Marking Services, Inc.
 10. Seton Identification Products, a Brady Corporation Company.
- A. Description: Preprinted or partially preprinted accident-prevention tags of plasticized card stock with matte finish suitable for writing.
1. Size: Approximately 4 by 7 inches.
 2. Fasteners: Brass grommet and wire.
 3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
 4. Color: Safety-yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.
- D. Coordinate locations of devices and equipment above ceilings and provide engraved label on ceiling at location of equipment or device.

3.3 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.

- B. Locate equipment labels where accessible and visible.

3.4 PIPE LABEL INSTALLATION

- A. Piping Color Coding: Painting of piping is specified in Section 099123 "Interior Painting." Section 099600 "High-Performance Coatings."
- B. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, with painted, color-coded bands or rectangles on each piping system.
 - 1. Identification Paint: Use for contrasting background.
 - 2. Stencil Paint: Use for pipe marking.
- C. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - 1. Near each valve and control device.
 - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 - 3. Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.
 - 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- D. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.
- E. Pipe Label Color Schedule:
 - 1. Refrigerant Piping: Black letters on a safety-white background.

3.5 DUCT LABEL INSTALLATION

- A. Install self-adhesive duct labels with permanent adhesive on air ducts in the following color codes:
 - 1. Blue: For cold-air supply ducts.
 - 2. Yellow: For hot-air supply ducts.
 - 3. Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
- B. Locate labels near points where ducts enter into and exit from concealed spaces and at maximum intervals of 50 feet in each space where ducts are exposed or concealed by removable ceiling system.

3.6 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
 - 1. Valve-Tag Size and Shape:
 - a. Refrigerant: 1-1/2 inches, round.
 - 2. Valve-Tag Colors:
 - a. Toxic and Corrosive Fluids: Black letters on a safety-orange background.
 - b. Flammable Fluids: Black letters on a safety-yellow background.
 - c. Combustible Fluids: White letters on a safety-brown background.
 - d. Potable and Other Water: White letters on a safety-green background.
 - e. Compressed Air: White letters on a safety-blue background.
 - f. Defined by User: White letters on a safety-purple background, black letters on a safety-white background, white letters on a safety-gray background, and white letters on a safety-black background

3.7 WARNING-TAG INSTALLATION

- A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 230553

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Balancing Air Systems:
 - a. Constant-volume air systems.
 - 2. Testing, Adjusting, and Balancing Equipment:
 - a. Motors.
 - b. Condensing units.
 - 3. Testing, adjusting, and balancing existing systems and equipment.
 - 4. Duct leakage tests.
 - 5. Control system verification.

1.3 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. BAS: Building automation systems.
- C. NEBB: National Environmental Balancing Bureau.
- D. TAB: Testing, adjusting, and balancing.
- E. TABB: Testing, Adjusting, and Balancing Bureau.
- F. TAB Specialist: An independent entity meeting qualifications to perform TAB work.
- G. TDH: Total dynamic head.

1.4 PREINSTALLATION MEETINGS

- A. TAB Conference: If requested by the Owner, conduct a TAB conference at Project site after approval of the TAB strategies and procedures plan to develop a mutual understanding of the details. Provide a minimum of 14 days' advance notice of scheduled meeting time and location.

1. Minimum Agenda Items:

- a. The Contract Documents examination report.
- b. The TAB plan.
- c. Needs for coordination and cooperation of trades and subcontractors.
- d. Proposed procedures for documentation and communication flow.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Within 30 days of Contractor's Notice to Proceed, submit documentation that the TAB specialist and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.
- B. Contract Documents Examination Report: Within 30 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.
- C. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.
- D. System Readiness Checklists: Within 30 days of Contractor's Notice to Proceed, submit system readiness checklists as specified in "Preparation" Article.
- E. Examination Report: Submit a summary report of the examination review required in "Examination" Article.
- F. Certified TAB reports.
- G. Sample report forms.
- H. Instrument calibration reports, to include the following:
 1. Instrument type and make.
 2. Serial number.
 3. Application.
 4. Dates of use.
 5. Dates of calibration.

1.6 QUALITY ASSURANCE

- A. TAB Specialists Qualifications: Certified by AABC or NEBB.
 1. TAB Field Supervisor: Employee of the TAB specialist and certified by AABC or NEBB.
 2. TAB Technician: Employee of the TAB specialist and certified by AABC or NEBB as a TAB technician.
- B. Instrumentation Type, Quantity, Accuracy, and Calibration: Comply with requirements in ASHRAE 111, Section 4, "Instrumentation."
- C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing."

- D. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.7.2.3 - "System Balancing."

1.7 FIELD CONDITIONS

- A. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems designs that may preclude proper TAB of systems and equipment.
- B. Examine installed systems for balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are applicable for intended purpose and are accessible.
- C. Examine the approved submittals for HVAC systems and equipment.
- D. Examine equipment performance data including fan and pump curves.
 - 1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
 - 2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.
- E. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
- F. Examine test reports specified in individual system and equipment Sections.
- G. Examine HVAC equipment and verify that bearings are greased, belts are aligned and tight, filters are clean, and equipment with functioning controls is ready for operation.
- H. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.
- I. Examine operating safety interlocks and controls on HVAC equipment.

- J. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

- A. Prepare a TAB plan that includes the following:
 - 1. Equipment and systems to be tested.
 - 2. Strategies and step-by-step procedures for balancing the systems.
 - 3. Instrumentation to be used.
 - 4. Sample forms with specific identification for all equipment.
- B. Perform system-readiness checks of HVAC systems and equipment to verify system readiness for TAB work. Include, at a minimum, the following:
 - 1. Airside:
 - a. Verify that leakage and pressure tests on air distribution systems have been satisfactorily completed.
 - b. Duct systems are complete with terminals installed.
 - c. Volume, smoke, and fire dampers are open and functional.
 - d. Clean filters are installed.
 - e. Fans are operating, free of vibration, and rotating in correct direction.
 - f. Variable-frequency controllers' startup is complete and safeties are verified.
 - g. Automatic temperature-control systems are operational.
 - h. Ceilings are installed.
 - i. Windows and doors are installed.
 - j. Suitable access to balancing devices and equipment is provided.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" and ASHRAE 111 and in this Section.
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
 - 1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
 - 2. After testing and balancing, install test ports and duct access doors that comply with requirements in Section 233300 "Air Duct Accessories."
 - 3. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 230713 "Duct Insulation," Section 230716 "HVAC Equipment Insulation," and Section 230719 "HVAC Piping Insulation."

- C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Cross-check the summation of required outlet volumes with required fan volumes.
- B. Prepare schematic diagrams of systems' "as-built" duct layouts.
- C. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- D. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.
- E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- F. Verify that motor starters are equipped with properly sized thermal protection.
- G. Check dampers for proper position to achieve desired airflow path.
- H. Check for airflow blockages.
- I. Check condensate drains for proper connections and functioning.
- J. Check for proper sealing of air-handling-unit components.
- K. Verify that air duct system is sealed as specified in Section 233113 "Metal Ducts."

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

- A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
 - 1. Measure total airflow.
 - a. Set outside-air, return-air, and relief-air dampers for proper position that simulates minimum outdoor-air conditions.
 - b. Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
 - c. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
 - d. If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.
 - 2. Measure fan static pressures as follows:

- a. Measure static pressure directly at the fan outlet or through the flexible connection.
 - b. Measure static pressure directly at the fan inlet or through the flexible connection.
 - c. Measure static pressure across each component that makes up the air-handling system.
 - d. Report artificial loading of filters at the time static pressures are measured.
 3. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
 4. Obtain approval from Construction Manager for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in HVAC Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
 5. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload occurs. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
- B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows.
1. Measure airflow of submain and branch ducts.
 2. Adjust submain and branch duct volume dampers for specified airflow.
 3. Re-measure each submain and branch duct after all have been adjusted.
- C. Adjust air inlets and outlets for each space to indicated airflows.
1. Set airflow patterns of adjustable outlets for proper distribution without drafts.
 2. Measure inlets and outlets airflow.
 3. Adjust each inlet and outlet for specified airflow.
 4. Re-measure each inlet and outlet after they have been adjusted.
- D. Verify final system conditions.
1. Re-measure and confirm that minimum outdoor, return, and relief airflows are within design. Readjust to design if necessary.
 2. Re-measure and confirm that total airflow is within design.
 3. Re-measure all final fan operating data, rpms, volts, amps, and static profile.
 4. Mark all final settings.
 5. Test system in economizer mode. Verify proper operation and adjust if necessary.
 6. Measure and record all operating data.
 7. Record final fan-performance data.

3.6 PROCEDURES FOR MOTORS

- A. Motors 1/2 HP and Larger: Test at final balanced conditions and record the following data:
1. Manufacturer's name, model number, and serial number.
 2. Motor horsepower rating.

3. Motor rpm.
4. Phase and hertz.
5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter size and thermal-protection-element rating.
8. Service factor and frame size.

- B. Motors Driven by Variable-Frequency Controllers: Test manual bypass of controller to prove proper operation.

3.7 PROCEDURES FOR CONDENSING UNITS

- A. Verify proper rotation of fans.
- B. Measure entering- and leaving-air temperatures.
- C. Record fan and motor operating data.

3.8 DUCT LEAKAGE TESTS

- A. Witness the duct pressure testing performed by Installer.
- B. Verify that proper test methods are used and that leakage rates are within specified tolerances.
- C. Report deficiencies observed.

3.9 CONTROLS VERIFICATION

- A. In conjunction with system balancing, perform the following:
 1. Verify temperature control system is operating within the design limitations.
 2. Confirm that the sequences of operation are in compliance with Contract Documents.
 3. Verify that controllers are calibrated and function as intended.
 4. Verify that controller set points are as indicated.
 5. Verify the operation of lockout or interlock systems.
 6. Verify the operation of valve and damper actuators.
 7. Verify that controlled devices are properly installed and connected to correct controller.
 8. Verify that controlled devices travel freely and are in position indicated by controller: open, closed, or modulating.
 9. Verify location and installation of sensors to ensure that they sense only intended temperature, humidity, or pressure.
- B. Reporting: Include a summary of verifications performed, remaining deficiencies, and variations from indicated conditions.

3.10 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

- A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.

1. Measure and record the operating speed, airflow, and static pressure of each fan.
 2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
 3. Check the refrigerant charge.
 4. Check the condition of filters.
 5. Check the condition of coils.
 6. Check the operation of the drain pan and condensate-drain trap.
 7. Check bearings and other lubricated parts for proper lubrication.
 8. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.
- B. Before performing testing and balancing of existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished. Verify the following:
1. New filters are installed.
 2. Coils are clean and fins combed.
 3. Drain pans are clean.
 4. Fans are clean.
 5. Bearings and other parts are properly lubricated.
 6. Deficiencies noted in the preconstruction report are corrected.
- C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.
1. Compare the indicated airflow of the renovated work to the measured fan airflows, and determine the new fan speed and the face velocity of filters and coils.
 2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
 3. If calculations increase or decrease the airflow rates and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.
 4. Balance each air outlet.

3.11 TOLERANCES

- A. Set HVAC system's airflow rates and water flow rates within the following tolerances:
1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent
 2. Air Outlets and Inlets: Plus or minus 10 percent.
- B. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.

3.12 PROGRESS REPORTING

- A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems balancing

devices. Recommend changes and additions to systems balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

- B. Status Reports: Prepare weekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.13 FINAL REPORT

- A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

- 1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
 - 2. Include a list of instruments used for procedures, along with proof of calibration.
 - 3. Certify validity and accuracy of field data.

- B. Final Report Contents: In addition to certified field-report data, include the following:

- 1. Fan curves.
 - 2. Manufacturers' test data.
 - 3. Field test reports prepared by system and equipment installers.
 - 4. Other information relative to equipment performance; do not include Shop Drawings and Product Data.

- C. General Report Data: In addition to form titles and entries, include the following data:

- 1. Title page.
 - 2. Name and address of the TAB specialist.
 - 3. Project name.
 - 4. Project location.
 - 5. Architect's name and address.
 - 6. Engineer's name and address.
 - 7. Contractor's name and address.
 - 8. Report date.
 - 9. Signature of TAB supervisor who certifies the report.
 - 10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
 - 11. Summary of contents including the following:
 - a. Indicated versus final performance.
 - b. Notable characteristics of systems.
 - c. Description of system operation sequence if it varies from the Contract Documents.
 - 12. Nomenclature sheets for each item of equipment.
 - 13. Data for terminal units, including manufacturer's name, type, size, and fittings.
 - 14. Notes to explain why certain final data in the body of reports vary from indicated values.
 - 15. Test conditions for fans and pump performance forms including the following:

- a. Settings for outdoor-, return-, and exhaust-air dampers.
 - b. Conditions of filters.
 - c. Cooling coil, wet- and dry-bulb conditions.
 - d. Face and bypass damper settings at coils.
 - e. Fan drive settings including settings and percentage of maximum pitch diameter.
 - f. Inlet vane settings for variable-air-volume systems.
 - g. Settings for supply-air, static-pressure controller.
 - h. Other system operating conditions that affect performance.
- D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
- 1. Quantities of outdoor, supply, return, and exhaust airflows.
 - 2. Duct, outlet, and inlet sizes.
 - 3. Balancing stations.
 - 4. Position of balancing devices.
- E. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:
- 1. Unit Data:
 - a. Unit identification.
 - b. Location.
 - c. Make and type.
 - d. Model number and unit size.
 - e. Manufacturer's serial number.
 - f. Unit arrangement and class.
 - g. Discharge arrangement.
 - h. Sheave make, size in inches, and bore.
 - i. Center-to-center dimensions of sheave and amount of adjustments in inches.
 - j. Number, make, and size of belts.
 - k. Number, type, and size of filters.
 - 2. Motor Data:
 - a. Motor make, and frame type and size.
 - b. Horsepower and rpm.
 - c. Volts, phase, and hertz.
 - d. Full-load amperage and service factor.
 - e. Sheave make, size in inches, and bore.
 - f. Center-to-center dimensions of sheave and amount of adjustments in inches.
 - 3. Test Data (Indicated and Actual Values):
 - a. Total airflow rate in cfm.
 - b. Total system static pressure in inches wg.
 - c. Fan rpm.
 - d. Discharge static pressure in inches wg.
 - e. Filter static-pressure differential in inches wg.
 - f. Preheat-coil static-pressure differential in inches wg.
 - g. Cooling-coil static-pressure differential in inches wg.

- h. Heating-coil static-pressure differential in inches wg.
- i. Outdoor airflow in cfm.
- j. Return airflow in cfm.
- k. Outdoor-air damper position.
- l. Return-air damper position.

F. Apparatus-Coil Test Reports:

1. Coil Data:

- a. System identification.
- b. Location.
- c. Coil type.
- d. Number of rows.
- e. Fin spacing in fins per inch o.c.
- f. Make and model number.
- g. Face area in sq. ft..
- h. Tube size in NPS.
- i. Tube and fin materials.
- j. Circuiting arrangement.

2. Test Data (Indicated and Actual Values):

- a. Airflow rate in cfm.
- b. Average face velocity in fpm.
- c. Air pressure drop in inches wg.
- d. Outdoor-air, wet- and dry-bulb temperatures in deg F.
- e. Return-air, wet- and dry-bulb temperatures in deg F.
- f. Entering-air, wet- and dry-bulb temperatures in deg F.
- g. Leaving-air, wet- and dry-bulb temperatures in deg F.
- h. Refrigerant expansion valve and refrigerant types.
- i. Refrigerant suction pressure in psig.
- j. Refrigerant suction temperature in deg F.

G. Electric-Coil Test Reports: For electric furnaces, duct coils, and electric coils installed in central-station air-handling units, include the following:

1. Unit Data:

- a. System identification.
- b. Location.
- c. Coil identification.
- d. Capacity in Btu/h.
- e. Number of stages.
- f. Connected volts, phase, and hertz.
- g. Rated amperage.
- h. Airflow rate in cfm.
- i. Face area in sq. ft.
- j. Minimum face velocity in fpm.

2. Test Data (Indicated and Actual Values):

- a. Heat output in Btu/h.
 - b. Airflow rate in cfm.
 - c. Air velocity in fpm.
 - d. Entering-air temperature in deg F.
 - e. Leaving-air temperature in deg F.
 - f. Voltage at each connection.
 - g. Amperage for each phase.
- H. Fan Test Reports: For supply, return, and exhaust fans, include the following:
 - 1. Fan Data:
 - a. System identification.
 - b. Location.
 - c. Make and type.
 - d. Model number and size.
 - e. Manufacturer's serial number.
 - f. Arrangement and class.
 - g. Sheave make, size in inches, and bore.
 - h. Center-to-center dimensions of sheave and amount of adjustments in inches.
 - 2. Motor Data:
 - a. Motor make, and frame type and size.
 - b. Horsepower and rpm.
 - c. Volts, phase, and hertz.
 - d. Full-load amperage and service factor.
 - e. Sheave make, size in inches, and bore.
 - f. Center-to-center dimensions of sheave, and amount of adjustments in inches.
 - g. Number, make, and size of belts.
 - 3. Test Data (Indicated and Actual Values):
 - a. Total airflow rate in cfm.
 - b. Total system static pressure in inches wg.
 - c. Fan rpm.
 - d. Discharge static pressure in inches wg.
 - e. Suction static pressure in inches wg.
- I. Round and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:
 - 1. Report Data:
 - a. System and air-handling-unit number.
 - b. Location and zone.
 - c. Traverse air temperature in deg F.
 - d. Duct static pressure in inches wg.
 - e. Duct size in inches.
 - f. Duct area in sq. ft.
 - g. Indicated airflow rate in cfm.

- h. Indicated velocity in fpm.
- i. Actual airflow rate in cfm.
- j. Actual average velocity in fpm.
- k. Barometric pressure in psig.

J. Air-Terminal-Device Reports:

1. Unit Data:

- a. System and air-handling unit identification.
- b. Location and zone.
- c. Apparatus used for test.
- d. Area served.
- e. Make.
- f. Number from system diagram.
- g. Type and model number.
- h. Size.
- i. Effective area in sq. ft.

2. Test Data (Indicated and Actual Values):

- a. Airflow rate in cfm.
- b. Air velocity in fpm.
- c. Preliminary airflow rate as needed in cfm.
- d. Preliminary velocity as needed in fpm.
- e. Final airflow rate in cfm.
- f. Final velocity in fpm.
- g. Space temperature in deg F.

K. System-Coil Reports: For reheat coils include the following:

1. Unit Data:

- a. System and air-handling-unit identification.
- b. Location and zone.
- c. Room or riser served.
- d. Coil make and size.
- e. Flowmeter type.

2. Test Data (Indicated and Actual Values):

- a. Airflow rate in cfm.
- b. Entering-air temperature in deg F.
- c. Leaving-air temperature in deg F.

L. Instrument Calibration Reports:

1. Report Data:

- a. Instrument type and make.
- b. Serial number.

- c. Application.
- d. Dates of use.
- e. Dates of calibration.

3.14 VERIFICATION OF TAB REPORT

- A. The TAB specialist's test and balance engineer shall conduct the inspection in the presence of Construction Manager.
- B. Construction Manager shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.
- C. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
- D. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.
- E. If TAB work fails, proceed as follows:
 - 1. TAB specialists shall recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
 - 2. If the second final inspection also fails, Owner may contract the services of another TAB specialist to complete TAB work according to the Contract Documents and deduct the cost of the services from the original TAB specialist's final payment.
 - 3. If the second verification also fails, Owner may contact AABC Headquarters regarding the AABC National Performance Guaranty.
- F. Prepare test and inspection reports.

3.15 ADDITIONAL TESTS

- A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 230593

SECTION 230713 - DUCT INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes insulating the following duct services:
 - 1. Indoor, concealed supply and outdoor air.
 - 2. Indoor, concealed return located in unconditioned space.
 - 3. Indoor, concealed exhaust between isolation damper and penetration of building exterior.
- B. Related Sections:
 - 1. Section 233113 "Metal Ducts" for duct liners.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
 - 2. Detail insulation application at elbows, fittings, dampers, specialties and flanges for each type of insulation.
 - 3. Detail application of field-applied jackets.
 - 4. Detail application at linkages of control devices.
- C. Samples: For each type of insulation and jacket indicated. Identify each Sample, describing product and intended use. Sample sizes are as follows:
 - 1. Sheet Form Insulation Materials: 12 inches square.
 - 2. Sheet Jacket Materials: 12 inches square.
 - 3. Manufacturer's Color Charts: For products where color is specified, show the full range of colors available for each type of finish material.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.

- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Coordinate clearance requirements with duct Installer for duct insulation application. Before preparing ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

1.8 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Duct Insulation Schedule, General," "Indoor Duct and Plenum Insulation Schedule," and "Aboveground, Outdoor Duct and Plenum Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type II for sheet materials.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. K-Flex USA.
- G. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTEED Corporation.
 - b. Johns Manville; a Berkshire Hathaway Company.
 - c. Knauf Insulation.
 - d. Manson Insulation, Inc.
 - e. Owens Corning.
- H. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. CertainTEED Corporation.
- b. Johns Manville; a Berkshire Hathaway Company.
- c. Knauf Insulation.
- d. Manson Insulation, Inc.
- e. Owens Corning.

2.2 FIRE-RATED INSULATION SYSTEMS

- A. Fire-Rated Blanket: High-temperature, flexible, blanket insulation with FSK jacket that is tested and certified to provide a 2-hour fire rating by an NRTL acceptable to authorities having jurisdiction.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M.
 - b. CertainTEED Corporation.
 - c. Johns Manville; a Berkshire Hathaway Company.
 - d. Nelson Firestop; a brand of Emerson Industrial Automation.
 - e. Thermal Ceramics.
 - f. Unifrax Corporation.

2.3 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. K-Flex USA.
 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.

- b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. Mon-Eco Industries, Inc.
- 2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. Mon-Eco Industries, Inc.
 - 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
- 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below ambient services.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Knauf Insulation.
 - d. Vimasco Corporation.
 - 2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 - 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 - 4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 - 5. Color: White.

C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. Mon-Eco Industries, Inc.
2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
3. Service Temperature Range: 0 to 180 deg F.
4. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
5. Color: White.

D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 30-mil dry film thickness.
3. Service Temperature Range: Minus 50 to plus 220 deg F.
4. Solids Content: ASTM D 1644, 33 percent by volume and 46 percent by weight.
5. Color: White.

2.5 LAGGING ADHESIVES

A. Description: Comply with MIL-A-3316C, Class I, Grade A and shall be compatible with insulation materials, jackets, and substrates.

1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Vimasco Corporation.
3. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over duct insulation.
4. Service Temperature Range: 0 to plus 180 deg F.
5. Color: White.

2.6 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. Mon-Eco Industries, Inc.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.7 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.
4. FSP Jacket: Aluminum-foil, fiberglass-reinforced scrim with polyethylene backing; complying with ASTM C 1136, Type II.
5. Vinyl Jacket: White vinyl with a permeance of 1.3 perms when tested according to ASTM E 96/E 96M, Procedure A, and complying with NFPA 90A and NFPA 90B.

2.8 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Glass-Fiber Fabric: Approximately 6 oz./sq. yd. with a thread count of 5 strands by 5 strands/sq. in. for covering ducts.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.

2.9 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. FSK Jacket: Aluminum-foil-face, fiberglass-reinforced scrim with kraft-paper backing.
- C. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Johns Manville; a Berkshire Hathaway Company.
 - b. P.I.C. Plastics, Inc.
 - c. Proto Corporation.
 - d. Speedline Corporation.
 - 2. Adhesive: As recommended by jacket material manufacturer.
 - 3. Color: White.
- D. Metal Jacket:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. RPR Products, Inc.
 - 2. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
 - a. Factory cut and rolled to size.
 - b. Finish and thickness are indicated in field-applied jacket schedules.
 - c. Moisture Barrier for Indoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.
 - d. Moisture Barrier for Outdoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.
- E. Self-Adhesive Outdoor Jacket: 60-mil-thick, laminated vapor barrier and waterproofing membrane for installation over insulation located aboveground outdoors; consisting of a rubberized bituminous resin on a crosslaminated polyethylene film covered with white aluminum-foil facing.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Polyguard Products, Inc.

2.10 TAPES

- A. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Avery Dennison Corporation, Specialty Tapes Division.
 - b. Compac Corporation.

- c. Ideal Tape Co., Inc., an American Biltrite Company.
- d. Knauf Insulation.
- e. Venture Tape.
- 2. Width: 3 inches.
- 3. Thickness: 6.5 mils.
- 4. Adhesion: 90 ounces force/inch in width.
- 5. Elongation: 2 percent.
- 6. Tensile Strength: 40 lbf/inch in width.
- 7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

2.11 SECUREMENTS

A. Bands:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. RPR Products, Inc.
- 2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304; 0.015 inch thick, 1/2 inch wide with closed seal.
- 3. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with closed seal.
- 4. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

B. Insulation Pins and Hangers:

- 1. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AGM Industries, Inc.
 - 2. Gemco.
 - 3. Midwest Fasteners, Inc.
 - b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - c. Spindle: Copper- or zinc-coated, low-carbon steel, fully annealed, 0.106-inch-diameter shank, length to suit depth of insulation indicated.
 - d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
- 2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick, galvanized-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AGM Industries, Inc.
 2. Gemco.
 3. Hardcast; a Carlisle Company.
 4. Midwest Fasteners, Inc.
 5. Nelson Stud Welding.
- b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.
3. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Gemco.
 2. Midwest Fasteners, Inc.
- C. Staples: Outward-clinching insulation staples, nominal 3/4-inch-wide, stainless steel or Monel.
- D. Wire: 0.080-inch nickel-copper alloy.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. C& F Wire.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
1. Verify that systems to be insulated have been tested and are free of defects.
 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.

- B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Keep insulation materials dry during application and finishing.
- G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- H. Install insulation with least number of joints practical.
- I. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
 - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
- J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- K. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
 - a. For below ambient services, apply vapor-barrier mastic over staples.
 - 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.
- L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 - 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 - 4. Seal jacket to wall flashing with flashing sealant.
- C. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- D. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.
 - 1. Comply with requirements in Section 078413 "Penetration Firestopping" and fire-resistive joint sealers.
- E. Insulation Installation at Floor Penetrations:
 - 1. Duct: For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
 - 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.6 INSTALLATION OF MINERAL-FIBER INSULATION

- A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
 - 1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
 - 2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
 - 3. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
 - a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
 - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
 - 4. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
 - 5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
 - 6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.
- B. Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
 - 1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
 - 2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
 - 3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

- a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
 - b. On duct sides with dimensions larger than 18 inches, space pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
 - c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
 - d. Do not overcompress insulation during installation.
 - e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
 - a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
 - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.7 FIELD-APPLIED JACKET INSTALLATION

- A. Where glass-cloth jackets are indicated, install directly over bare insulation or insulation with factory-applied jackets.
 1. Draw jacket smooth and tight to surface with 2-inch overlap at seams and joints.
 2. Embed glass cloth between two 0.062-inch-thick coats of lagging adhesive.
 3. Completely encapsulate insulation with coating, leaving no exposed insulation.
- B. Where FSK jackets are indicated, install as follows:
 1. Draw jacket material smooth and tight.
 2. Install lap or joint strips with same material as jacket.
 3. Secure jacket to insulation with manufacturer's recommended adhesive.

4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch-wide joint strips at end joints.
 5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.
- C. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.8 FIRE-RATED INSULATION SYSTEM INSTALLATION

- A. Where fire-rated insulation system is indicated, secure system to ducts and duct hangers and supports to maintain a continuous fire rating.
- B. Insulate duct access panels and doors to achieve same fire rating as duct.
- C. Install firestopping at penetrations through fire-rated assemblies. Fire-stop systems are specified in Section 078413 "Penetration Firestopping."

3.9 FINISHES

- A. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.
- B. Do not field paint aluminum or stainless-steel jackets.

3.10 FIELD QUALITY CONTROL

- A. Tests and Inspections:
1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.
- B. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.11 DUCT INSULATION SCHEDULE, GENERAL

- A. Plenums and Ducts Requiring Insulation:
1. Indoor, concealed supply and outdoor air.
 2. Indoor, concealed return located in unconditioned space.
 3. Indoor, concealed exhaust between isolation damper and penetration of building exterior.
- B. Items Not Insulated:

1. Fibrous-glass ducts.
2. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
3. Factory-insulated flexible ducts.
4. Factory-insulated plenums and casings.
5. Flexible connectors.
6. Vibration-control devices.
7. Factory-insulated access panels and doors.

3.12 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

- A. Concealed, round, supply-air duct insulation shall be one of the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.
 2. Mineral-Fiber Board: 1-1/2 inches thick and 3-lb/cu. ft. nominal density.
- B. Concealed, round, return-air duct insulation shall be one of the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.
 2. Mineral-Fiber Board: 1-1/2 inches thick and 3-lb/cu. ft. nominal density.
- C. Concealed, rectangular, supply-air duct insulation shall be one of the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.
 2. Mineral-Fiber Board: 1-1/2 inches thick and 3-lb/cu. ft. nominal density.
- D. Concealed, rectangular, return-air duct insulation shall be one of the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.
 2. Mineral-Fiber Board: 1-1/2 inches thick and 3-lb/cu. ft. nominal density.
- E. Concealed, rectangular, outdoor-air duct insulation shall be one of the following:
 1. Flexible Elastomeric: 1 inch thick.
 2. Polyolefin: 1 inch thick.

3.13 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.

END OF SECTION 230713

SECTION 230719 - HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes insulating the following HVAC piping systems:
 - 1. Condensate drain piping, indoors.
 - 2. Refrigerant suction and hot-gas piping, indoors and outdoors.
- B. Related Sections:
 - 1. Section 230713 "Duct Insulation."

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
 - 2. Detail insulation application at pipe expansion joints for each type of insulation.
 - 3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
 - 4. Detail removable insulation at piping specialties.
 - 5. Detail application of field-applied jackets.
 - 6. Detail application at linkages of control devices.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

1.8 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Armacell LLC.
 - b. Armstrong.
 - c. K-Flex USA.
 - d. Owens Corning.

2.2 INSULATING CEMENTS

- A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Ramco Insulation, Inc.

2.3 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. K-Flex USA.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Knauf Insulation.
 - d. Vimasco Corporation.
 2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 5. Color: White.
- C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below-ambient services.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
 2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
 3. Service Temperature Range: 0 to 180 deg F.
 4. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
 5. Color: White.

D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below-ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 30-mil dry film thickness.
3. Service Temperature Range: Minus 50 to plus 220 deg F.
4. Solids Content: ASTM D 1644, 33 percent by volume and 46 percent by weight.
5. Color: White.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 1. Verify that systems to be insulated have been tested and are free of defects.
 2. Verify that surfaces to be insulated are clean and dry.
 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.
- C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
 - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
 - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- O. For above-ambient services, do not install insulation to the following:
 - 1. Vibration-control devices.
 - 2. Testing agency labels and stamps.
 - 3. Nameplates and data plates.

3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install

- insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 - 4. Seal jacket to roof flashing with flashing sealant.
 - B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
 - C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 - 4. Seal jacket to wall flashing with flashing sealant.
 - D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
 - E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
 - 1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.
 - F. Insulation Installation at Floor Penetrations:
 - 1. Pipe: Install insulation continuously through floor penetrations.
 - 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."
- 3.5 GENERAL PIPE INSULATION INSTALLATION
- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
 - B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
 - 1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 - 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.

3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
 5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
 6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
 7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
 8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
 9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.
- D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
 2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
 3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
 4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches (50 mm) over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe

insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.

5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- B. Insulation Installation on Pipe Flanges:
 1. Install pipe insulation to outer diameter of pipe flange.
 2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
 3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
 4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- C. Insulation Installation on Pipe Fittings and Elbows:
 1. Install mitered sections of pipe insulation.
 2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- D. Insulation Installation on Valves and Pipe Specialties:
 1. Install preformed valve covers manufactured of same material as pipe insulation when available.
 2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 3. Install insulation to flanges as specified for flange insulation application.
 4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.7 FINISHES

- A. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.
- B. Do not field paint aluminum or stainless-steel jackets.

3.8 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - 1. Drainage piping located in crawl spaces.
 - 2. Underground piping.
 - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.9 INDOOR PIPING INSULATION SCHEDULE

- A. Condensate and Equipment Drain Water below 60 Deg F:
 - 1. All Pipe Sizes: Insulation shall be the following:
 - a. Flexible Elastomeric: 3/4 inch thick.
- B. Refrigerant Suction and Hot-Gas Piping:
 - 1. All Pipe Sizes: Insulation shall be the following:
 - a. Flexible Elastomeric: 1 inch thick.
- C. Refrigerant Suction and Hot-Gas Flexible Tubing:
 - 1. All Pipe Sizes: Insulation shall be the following:
 - a. Flexible Elastomeric: 1 inch thick.

3.10 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

- A. Refrigerant Suction and Hot-Gas Piping:
 - 1. All Pipe Sizes: Insulation shall be the following:
 - a. Flexible Elastomeric: 2 inches thick.
- B. Refrigerant Suction and Hot-Gas Flexible Tubing:
 - 1. All Pipe Sizes: Insulation shall be the following:
 - a. Flexible Elastomeric: 2 inches thick.

END OF SECTION 230719

SECTION 232300 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Refrigerant pipes and fittings.
 - 2. Refrigerant piping valves and specialties.
 - 3. Refrigerants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of valve and refrigerant piping specialty.
 - 1. Include pressure drop, based on manufacturer's test data, for the following:
 - a. Thermostatic expansion valves.
 - b. Solenoid valves.
 - c. Hot-gas bypass valves.
 - d. Filter dryers.
 - e. Strainers.
 - f. Pressure-regulating valves.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."
- B. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.6 PRODUCT STORAGE AND HANDLING

- A. Store piping with end caps in place to ensure that piping interior and exterior are clean when installed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Line Test Pressure for Refrigerant R-410A:
 - 1. Suction Lines for Air-Conditioning Applications: 300 psig.
 - 2. Suction Lines for Heat-Pump Applications: 535 psig.
 - 3. Hot-Gas and Liquid Lines: 535 psig.

2.2 COPPER TUBE AND FITTINGS

- A. Copper Tube: ASTM B 280, Type ACR.
- B. Wrought-Copper Fittings: ASME B16.22.
- C. Wrought-Copper Unions: ASME B16.22.
- D. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.
- E. Brazing Filler Metals: AWS A5.8/A5.8M.
- F. Flexible Connectors:
 - 1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
 - 2. End Connections: Socket ends.
 - 3. Offset Performance: Capable of minimum 3/4-inch misalignment in minimum 7-inch-long assembly.
 - 4. Working Pressure Rating: Factory test at minimum 500 psig.
 - 5. Maximum Operating Temperature: 250 deg F.

2.3 VALVES AND SPECIALTIES

- A. Diaphragm Packless Valves:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Heldon Products; Henry Technologies.
 - c. Parker Hannifin Corp.
 - d. Paul Mueller Company.

2. Body and Bonnet: Forged brass or cast bronze; globe design with straight-through or angle pattern.
3. Diaphragm: Phosphor bronze and stainless steel with stainless-steel spring.
4. Operator: Rising stem and hand wheel.
5. Seat: Nylon.
6. End Connections: Socket, union, or flanged.
7. Working Pressure Rating: 500 psig.
8. Maximum Operating Temperature: 275 deg F.

B. Packed-Angle Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Heldon Products; Henry Technologies.
 - c. Parker Hannifin Corp.
 - d. Paul Mueller Company.
2. Body and Bonnet: Forged brass or cast bronze.
3. Packing: Molded stem, back seating, and replaceable under pressure.
4. Operator: Rising stem.
5. Seat: Nonrotating, self-aligning polytetrafluoroethylene.
6. Seal Cap: Forged-brass or valox hex cap.
7. End Connections: Socket, union, threaded, or flanged.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 275 deg F.

C. Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. Danfoss Inc.
 - c. Emerson Climate Technologies.
 - d. Heldon Products; Henry Technologies.
 - e. Parker Hannifin Corp.
 - f. Paul Mueller Company.
2. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
3. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.
4. Piston: Removable polytetrafluoroethylene seat.
5. Closing Spring: Stainless steel.
6. Manual Opening Stem: Seal cap, plated-steel stem, and graphite seal.
7. End Connections: Socket, union, threaded, or flanged.
8. Maximum Opening Pressure: 0.50 psig.
9. Working Pressure Rating: 500 psig.
10. Maximum Operating Temperature: 275 deg F.

D. Service Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Parker Hannifin Corp.
 - e. Paul Mueller Company.
 - f. Refrigeration Sales, Inc.
2. Body: Forged brass with brass cap including key end to remove core.
3. Core: Removable ball-type check valve with stainless-steel spring.
4. Seat: Polytetrafluoroethylene.
5. End Connections: Copper spring.
6. Working Pressure Rating: 500 psig.

E. Solenoid Valves: Comply with AHRI 760 and UL 429; listed and labeled by a National Recognized Testing Laboratory (NRTL).

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Parker Hannifin Corp.
 - e. Paul Mueller Company.
2. Body and Bonnet: Plated steel.
3. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
4. Seat: Polytetrafluoroethylene.
5. End Connections: Threaded.
6. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter, and 24-V ac coil.
7. Working Pressure Rating: 400 psig.
8. Maximum Operating Temperature: 240 deg F.

F. Thermostatic Expansion Valves: Comply with AHRI 750.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Paul Mueller Company.
2. Body, Bonnet, and Seal Cap: Forged brass or steel.
3. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.

4. Packing and Gaskets: Non-asbestos.
5. Capillary and Bulb: Copper tubing filled with refrigerant charge.
6. Suction Temperature: 40 deg F.
7. Superheat: Adjustable or Nonadjustable.
8. Reverse-flow option (for heat-pump applications).
9. End Connections: Socket, flare, or threaded union.
10. Working Pressure Rating: 700 psig.

G. Hot-Gas Bypass Valves: Comply with UL 429; listed and labeled by an NRTL.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Heldon Products; Henry Technologies.
 - c. Parker Hannifin Corp.
2. Body, Bonnet, and Seal Cap: Ductile iron or steel.
3. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
4. Packing and Gaskets: Non-asbestos.
5. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
6. Seat: Polytetrafluoroethylene.
7. Equalizer: Internal.
8. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter and 24-V ac coil.
9. End Connections: Socket.
10. Throttling Range: Maximum 5 psig.
11. Working Pressure Rating: 500 psig.
12. Maximum Operating Temperature: 240 deg F.

H. Moisture/Liquid Indicators:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Parker Hannifin Corp.
2. Body: Forged brass.
3. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
4. Indicator: Color coded to show moisture content in parts per million (ppm).
5. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
6. End Connections: Socket or flare.
7. Working Pressure Rating: 500 psig.
8. Maximum Operating Temperature: 240 deg F.

I. Replaceable-Core Filter Dryers: Comply with AHRI 730.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Parker Hannifin Corp.
2. Body and Cover: Painted-steel shell with ductile-iron cover, stainless-steel screws, and neoprene gaskets.
3. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
4. Desiccant Media: Activated alumina.
5. Designed for reverse flow (for heat-pump applications).
6. End Connections: Socket.
7. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
8. Maximum Pressure Loss: 2 psig.
9. Rated Flow: 10 tons.
10. Working Pressure Rating: 500 psig.
11. Maximum Operating Temperature: 240 deg F.

J. Permanent Filter Dryers: Comply with AHRI 730.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Parker Hannifin Corp.
2. Body and Cover: Painted-steel shell.
3. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
4. Desiccant Media: Activated alumina.
5. Designed for reverse flow (for heat-pump applications).
6. End Connections: Socket.
7. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
8. Maximum Pressure Loss: 2 psig.
9. Rated Flow: 10 tons.
10. Working Pressure Rating: 500 psig.
11. Maximum Operating Temperature: 240 deg F.

K. Receivers: Comply with AHRI 495.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Heldon Products; Henry Technologies.
2. Comply with 2010 ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
3. Comply with UL 207; listed and labeled by an NRTL.
4. Body: Welded steel with corrosion-resistant coating.
5. Tappings: Inlet, outlet, liquid level indicator, and safety relief valve.
6. End Connections: Socket or threaded.
7. Working Pressure Rating: 500 psig.
8. Maximum Operating Temperature: 275 deg F.

L. Liquid Accumulators: Comply with AHRI 495.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Emerson Climate Technologies.
 - b. Heldon Products; Henry Technologies.
 - c. Parker Hannifin Corp.
2. Body: Welded steel with corrosion-resistant coating.
3. End Connections: Socket or threaded.
4. Working Pressure Rating: 500 psig.
5. Maximum Operating Temperature: 275 deg F.

2.4 REFRIGERANTS

A. ASHRAE 34, R-410A: Pentafluoroethane/Difluoromethane.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Arkema Inc.
 - b. DuPont Fluorochemicals Div.
 - c. Genetron Refrigerants; Honeywell International Inc.
 - d. Mexichem Fluor Inc.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS FOR REFRIGERANT R-410A

- A. Suction Lines NPS 1-1/2 and Smaller for Conventional Air-Conditioning Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed or soldered joints.
- B. Hot-Gas and Liquid Lines: Copper, Type ACR, annealed- or drawn-temper tubing and wrought-copper fittings with brazed or soldered joints.

3.2 VALVE AND SPECIALTY APPLICATIONS

- A. Install diaphragm packless or packed-angle valves in suction and discharge lines of compressor.
- B. Install service valves for gage taps at inlet and outlet of hot-gas bypass valves and strainers if they are not an integral part of valves and strainers.
- C. Install a check valve at the compressor discharge and a liquid accumulator at the compressor suction connection.
- D. Except as otherwise indicated, install diaphragm packless or packed-angle valves on inlet and outlet side of filter dryers.
- E. Install solenoid valves upstream from each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at top.
- F. Install thermostatic expansion valves as close as possible to distributors on evaporators.
 - 1. Install valve so diaphragm case is warmer than bulb.
 - 2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line.
 - 3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.
- G. Install moisture/liquid indicators in liquid line at the inlet of the thermostatic expansion valve or at the inlet of the evaporator coil capillary tube.
- H. Install filter dryers in liquid line between compressor and thermostatic expansion valve.
- I. Install receivers sized to accommodate pump-down charge.
- J. Install flexible connectors at compressors.

3.3 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

- B. Install refrigerant piping according to ASHRAE 15.
- C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping adjacent to machines to allow service and maintenance.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Select system components with pressure rating equal to or greater than system operating pressure.
- J. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
- K. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels as specified in Section 083113 "Access Doors and Frames" if valves or equipment requiring maintenance is concealed behind finished surfaces.
- L. Install refrigerant piping in protective conduit where installed belowground.
- M. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.
- N. Slope refrigerant piping as follows:
 - 1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
 - 2. Install horizontal suction lines with a uniform slope downward to compressor.
 - 3. Install traps and double risers to entrain oil in vertical runs.
 - 4. Liquid lines may be installed level.
- O. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.
- P. Before installation of steel refrigerant piping, clean pipe and fittings using the following procedures:
 - 1. Shot blast the interior of piping.
 - 2. Remove coarse particles of dirt and dust by drawing a clean, lintless cloth through tubing by means of a wire or electrician's tape.
 - 3. Draw a clean, lintless cloth saturated with trichloroethylene through the tube or pipe. Continue this procedure until cloth is not discolored by dirt.

4. Draw a clean, lintless cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.
 5. Finally, draw a clean, dry, lintless cloth through the tube or pipe.
 6. Safety-relief-valve discharge piping is not required to be cleaned but is required to be open to allow unrestricted flow.
- Q. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.
- R. Identify refrigerant piping and valves according to Section 230553 "Identification for HVAC Piping and Equipment."
- S. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- T. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- U. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

3.4 PIPE JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide), during brazing or welding, to prevent scale formation.
- D. Soldered Joints: Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook."
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
1. Use Type BCuP (copper-phosphorus) alloy for joining copper socket fittings with copper pipe.
 2. Use Type BAg (cadmium-free silver) alloy for joining copper with bronze or steel.
- F. Threaded Joints: Thread steel pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and to restore full ID. Join pipe fittings and valves as follows:
1. Apply appropriate tape or thread compound to external pipe threads unless dry-seal threading is specified.
 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Steel pipe can be threaded, but threaded joints must be seal brazed or seal welded.
- H. Welded Joints: Construct joints according to AWS D10.12M/D10.12.

- I. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.5 HANGERS AND SUPPORTS

- A. Comply with requirements for pipe hangers and supports specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Install the following pipe attachments:
 - 1. Adjustable steel clevis hangers for individual horizontal runs.
 - 2. Spring hangers to support vertical runs.
 - 3. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
- C. Install hangers for copper tubing with the following maximum spacing and minimum rod diameters:
 - 1. NPS 1/2: Maximum span, 60 inches; minimum rod, 1/4 inch.
 - 2. NPS 5/8: Maximum span, 60 inches; minimum rod, 1/4 inch.
 - 3. NPS 1: Maximum span, 72 inches; minimum rod, 1/4 inch.
 - 4. NPS 1-1/4: Maximum span, 96 inches; minimum rod, 3/8 inch.
 - 5. NPS 1-1/2: Maximum span, 96 inches; minimum rod, 3/8 inch.

3.6 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Comply with ASME B31.5, Chapter VI.
 - 2. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
 - 3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in "Performance Requirements" Article.
 - a. Fill system with nitrogen to the required test pressure.
 - b. System shall maintain test pressure at the manifold gage throughout duration of test.
 - c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
 - d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.
- B. Prepare test and inspection reports.

3.7 SYSTEM CHARGING

- A. Charge system using the following procedures:
 - 1. Install core in filter dryers after leak test but before evacuation.

2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.
3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
4. Charge system with a new filter-dryer core in charging line.

3.8 ADJUSTING

- A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.
- B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.
- C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.
- D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
 1. Open shutoff valves in condenser water circuit.
 2. Verify that compressor oil level is correct.
 3. Open compressor suction and discharge valves.
 4. Open refrigerant valves except bypass valves that are used for other purposes.
 5. Check open compressor-motor alignment and verify lubrication for motors and bearings.
- E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION 232300

SECTION 233113 - METAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Single-wall rectangular ducts and fittings.
2. Double-wall rectangular ducts and fittings.
3. Single-wall round ducts and fittings.
4. Sheet metal materials.
5. Sealants and gaskets.
6. Hangers and supports.

- B. Related Sections:

1. Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
2. Section 233116 "Nonmetal Ducts" for fibrous-glass ducts, thermoset fiber-reinforced plastic ducts, thermoplastic ducts, PVC ducts, and concrete ducts.
3. Section 233119 "HVAC Casings" for factory- and field-fabricated casings for mechanical equipment.
4. Section 233300 "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in Duct Construction Notes on mechanical drawings.
- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of the following products:
 - 1. Liners and adhesives.
 - 2. Sealants and gaskets.
- B. Shop Drawings:
 - 1. Factory- and shop-fabricated ducts and fittings.
 - 2. Fittings.
 - 3. Seam and joint construction.
 - 4. Penetrations through fire-rated and other partitions.
 - 5. Equipment installation based on equipment being used on Project.
 - 6. Hangers and supports, including methods for duct and building attachment and vibration isolation.
- C. Delegated-Design Submittal:
 - 1. Sheet metal thicknesses.
 - 2. Joint and seam construction and sealing.
 - 3. Reinforcement details and spacing.
 - 4. Materials, fabrication, assembly, and spacing of hangers and supports.
 - 5. Design Calculations: Calculations for selecting hangers and supports.

1.5 QUALITY ASSURANCE

- A. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."
- B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

PART 2 - PRODUCTS

2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal

Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 DOUBLE-WALL RECTANGULAR DUCTS AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. McGill Airflow LLC.
 - 2. MKT Metal Manufacturing.
 - 3. Set Duct Manufacturing.
 - 4. Sheet Metal Connectors, Inc.
- B. Rectangular Ducts: Fabricate ducts with indicated dimensions for the inner duct.
- C. Outer Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- D. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- F. Interstitial Insulation: Flexible elastomeric duct liner complying with ASTM C 534, Type II for sheet materials, and with NFPA 90A or NFPA 90B.
 - 1. Maximum Thermal Conductivity: 0.25 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.
- G. Inner Duct: Minimum 0.028-inch solid sheet steel.
- H. Formed-on Transverse Joints (Flanges): Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials

involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

- I. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SINGLE-WALL ROUND DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ductmate Industries, Inc.
 - b. Elgen Manufacturing.
 - c. Linx Industries (formerly Lindab).
 - d. McGill AirFlow LLC.
 - e. MKT Metal Manufacturing.
 - f. Nordfab Ducting.
 - g. SEMCO, LLC: part of Flaktgroup.
 - h. Set Duct Manufacturing
 - i. Sheet Metal Connectors, Inc.
 - j. Spiral Manufacturing Co., Inc.
 - k. Stamped Fittings Inc.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.4 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction

methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G90.
 - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- C. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in the "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D, No. 3, or No. 4 as indicated in the "Duct Schedule" Article.
- D. Aluminum Sheets: Comply with ASTM B 209 Alloy 3003, H14 temper; with mill finish for concealed ducts, and standard, one-side bright finish for duct surfaces exposed to view.
- E. Factory- or Shop-Applied Antimicrobial Coating:
 - 1. Apply to the surface of sheet metal that will form the interior surface of the duct. An untreated clear coating shall be applied to the exterior surface.
 - 2. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
 - 3. Coating containing the antimicrobial compound shall have a hardness of 2H, minimum, when tested according to ASTM D 3363.
 - 4. Surface-Burning Characteristics: Maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
 - 5. Shop-Applied Coating Color: Black or White.
 - 6. Antimicrobial coating on sheet metal is not required for duct containing liner treated with antimicrobial coating.
- F. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
 - 1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.
- G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.5 SEALANT AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- B. Two-Part Tape Sealing System:
 - 1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
 - 2. Tape Width: 4 inches.
 - 3. Sealant: Modified styrene acrylic.

4. Water resistant.
5. Mold and mildew resistant.
6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
7. Service: Indoor and outdoor.
8. Service Temperature: Minus 40 to plus 200 deg F.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
10. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
11. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Solvent-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Base: Synthetic rubber resin.
3. Solvent: Toluene and heptane.
4. Solids Content: Minimum 60 percent.
5. Shore A Hardness: Minimum 60.
6. Water resistant.
7. Mold and mildew resistant.
8. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
9. VOC: Maximum 395 g/L.
10. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
11. Maximum Static-Pressure Class: 10-inch wg, positive or negative.
12. Service: Indoor or outdoor.
13. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

E. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.

4. Class: 25.
5. Use: O.
6. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

F. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

G. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.6 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."

C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

D. Trapeze and Riser Supports:

1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install round ducts in maximum practical lengths.

- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.
- K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Section 233300 "Air Duct Accessories" for fire and smoke dampers.
- L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

3.2 INSTALLATION OF EXPOSED DUCTWORK

- A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.
- B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.
- C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.
- D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.
- E. Repair or replace damaged sections and finished work that does not comply with these requirements.

3.3 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

- B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
 - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 - 2. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
 - 3. Unconditioned Space, Exhaust Ducts: Seal Class C.
 - 4. Unconditioned Space, Return-Air Ducts: Seal Class B.
 - 5. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
 - 6. Conditioned Space, Exhaust Ducts: Seal Class B.
 - 7. Conditioned Space, Return-Air Ducts: Seal Class C.

3.4 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 - 1. Where practical, install concrete inserts before placing concrete.
 - 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 - 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 - 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports.
- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.5 CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Section 233300 "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.6 PAINTING

- A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Leakage Tests:
 - 1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
 - 2. Test the following systems:
 - a. Supply Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - b. Return Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - c. Exhaust Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - d. Outdoor Air Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - 3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
 - 4. Test for leaks before applying external insulation.
 - 5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
 - 6. Give seven days' advance notice for testing.

3.8 DUCT CLEANING

- A. Clean new duct system(s) before testing, adjusting, and balancing.

3.9 START UP

- A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

END OF SECTION 233113

SECTION 233116 - NONMETAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Fibrous-glass ducts and fittings.

- B. Related Sections:

- 1. Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for nonmetal ducts.
- 2. Section 233113 "Metal Ducts" for single- and double-wall, rectangular and round ducts.
- 3. Section 233300 "Air Duct Accessories" for dampers, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including duct closure, reinforcements, and hangers and supports, shall comply with SMACNA's "Fibrous Glass Duct Construction Standards" and performance requirements and design criteria indicated.

- 1. Static-Pressure Classes:

- a. Supply Ducts (except in Mechanical Rooms): 1-inch wg.
- b. Supply Ducts (in Mechanical Equipment Rooms): 2-inch wg.
- c. Return Ducts (Negative Pressure): 1-inch wg.

- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions to comply with ASCE/SEI 7.

- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of the following products:

- 1. Fibrous-glass duct materials.

B. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Fittings.
3. Seam and joint construction.
4. Penetrations through fire-rated and other partitions.
5. Equipment installation based on equipment being used on Project.
6. Hangers and supports, including methods for duct and building attachment and vibration isolation.

C. Delegated-Design Submittal:

1. Duct materials and thicknesses.
2. Joint and seam construction and sealing.
3. Reinforcement details and spacing.
4. Design Calculations: Calculations for selecting hangers and supports.

1.5 QUALITY ASSURANCE

- A. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."
- B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."
- C. NFPA Compliance:
1. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."
 2. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

PART 2 - PRODUCTS

2.1 FIBROUS-GLASS DUCTS AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CertainTeed Corporation.
 2. Johns Manville; a Berkshire Hathaway company.
 3. Knauf Insulation.
 4. Owens Corning.
- B. Fibrous-Glass Duct Materials: Resin-bonded fiberglass, faced on the outside surface with fire-resistive FSK vapor retarder and with a smooth fiberglass mat finish on the air-side surface.
1. Duct Board: Factory molded into rectangular boards.

2. Temperature Limits: 40 to 250 deg F inside ducts; 150 deg F ambient temperature surrounding ducts.
3. Maximum Thermal Conductivity: 0.24 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.
4. Moisture Absorption: Not exceeding 5 percent by weight at 120 deg F and 95 percent relative humidity for 96 hours when tested according to ASTM C 1104/C 1104M.
5. Permeability: 0.02 perms maximum when tested according to ASTM E 96/E 96M, Procedure A.
6. Antimicrobial Agent: Compound shall be tested for efficacy by an NRTL, and registered by the EPA for use in HVAC systems.
7. Noise-Reduction Coefficient: 0.65 minimum when tested according to ASTM C 423, Mounting A.
8. Required Markings: EI rating, UL label, and other markings required by UL 181 on each full sheet of duct board.

C. Closure Materials:

1. Pressure-Sensitive Tape: Comply with UL 181A; imprinted by the manufacturer with the coding "181A-P," the manufacturer's name, and a date code.
 - a. Tape: Aluminum foil-scrim tape imprinted with listing information.
 - b. Minimum Tape Width: 2-1/2 inches; 3 inches for duct board thicker than 1 inch.
 - c. Staples: 1/2-inch outward clinching, 2 inches o.c. in tabs, one tab per joint.
 - d. Water resistant.
 - e. Mold and mildew resistant.
2. Heat-Activated Tape: Comply with UL 181A; imprinted by the manufacturer with the coding "181A-H," the manufacturer's name, and a date code.
 - a. Tape: Aluminum foil-scrim tape imprinted with listing information.
 - b. Minimum Tape Width: 3 inches.
 - c. Heat-Sensitive Imprint: Printed indicator on tape to show proper heating during application has been achieved.
 - d. Water resistant.
 - e. Mold and mildew resistant.
3. Two-Part Tape Sealing System: Comply with UL 181A; imprinted by the manufacturer with the coding "181A-M," the manufacturer's name, and a date code.
 - a. Tape: Woven glass fiber impregnated with mineral gypsum.
 - b. Minimum Tape Width: 3 inches.
 - c. Sealant: Modified styrene acrylic.
 - d. Water resistant.
 - e. Mold and mildew resistant.
 - f. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - g. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Fabrication:

1. Select joints, seams, transitions, elbows, and branch connections and fabricate according to SMACNA's "Fibrous Glass Duct Construction Standards," Chapter 2, "Specifications and Closure," and Chapter 4, "Fittings and Connections."
2. Fabricate 90-degree mitered elbows to include turning vanes.
3. Reinforcements: Comply with requirements in SMACNA's "Fibrous Glass Duct Construction Standards," Chapter 5, "Reinforcement" for channel- and tie-rod reinforcement materials, spacing, and fabrication.

2.2 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size,".
- C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- D. Trapeze and Riser Supports: Steel shapes complying with ASTM A 36/A 36M.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

- A. Install ducts with fewest possible joints.
- B. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- C. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- D. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- E. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges. Overlap openings on four sides by at least 1-1/2 inches.
- F. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Section 233300 "Air Duct Accessories" for fire and smoke dampers.
- G. Protect duct interiors from the moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."
- H. Install fibrous-glass ducts and fittings to comply with SMACNA's "Fibrous Glass Duct Construction Standards."

3.2 HANGER AND SUPPORT INSTALLATION

- A. Install hangers and supports for fibrous-glass ducts and fittings to comply with SMACNA's "Fibrous Glass Duct Construction Standards," Chapter 6, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 - 1. Install concrete inserts before placing concrete.
 - 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 - 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 - 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
- C. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Leakage Tests:
 - 1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
 - 2. Test the following systems:
 - a. Supply Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - b. Return Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - 3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
 - 4. Test for leaks before applying external insulation.
 - 5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test entire system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
 - 6. Give seven days' advance notice for testing.

3.4 DUCT CLEANING

- A. Clean new duct system(s) before testing, adjusting, and balancing.

3.5 START UP

- A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

3.6 DUCT SCHEDULE

- A. Indoor Ducts and Fittings:

- 1. Fibrous-Glass Rectangular Ducts and Fittings:
 - a. Minimum Flexural Rigidity: EI-800.
 - b. Minimum Board Thickness: 1-1/2 inches.

END OF SECTION 233116

SECTION 233300 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Backdraft and pressure relief dampers.
2. Manual volume dampers.
3. Control dampers.
4. Fire dampers.
5. Turning vanes.
6. Flexible connectors.
7. Flexible ducts.
8. Duct accessory hardware.

- B. Related Requirements:

1. Section 233723 "HVAC Gravity Ventilators" for roof-mounted ventilator caps.
2. Section 284612 "Addressable Fire-Alarm Systems" for duct-mounted fire and smoke detectors.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. For duct silencers, include pressure drop and dynamic insertion loss data. Include breakout noise calculations for high transmission loss casings.

- B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.

1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
 - a. Special fittings.
 - b. Manual volume damper installations.
 - c. Control-damper installations.
 - d. Fire-damper installations, including sleeves; and duct-mounted access doors and remote damper operators.

- e. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which ceiling-mounted access panels and access doors required for access to duct accessories are shown and coordinated with each other, using input from Installers of the items involved.
- B. Source quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.2 MATERIALS

- A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G90.
 - 2. Exposed-Surface Finish: Mill phosphatized.
- B. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and finish for exposed ducts.
- C. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.
- D. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.
- E. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- F. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 BACKDRAFT AND PRESSURE RELIEF DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Warming and Ventilating; a Mestek Architectural Group company.
 2. Cesco Products; a division of MESTEK, Inc.
 3. Greenheck Fan Corporation.
 4. Lloyd Industries, Inc.
 5. Nailor Industries Inc.
 6. NCA Manufacturing, Inc.
 7. Pottorff.
 8. Ruskin Company.
 9. Safe Air – Dowco Products.
 10. United Enertech.
 11. Vent Products Co., Inc.
- B. Description: Gravity balanced.
- C. Maximum Air Velocity: 1000 fpm.
- D. Maximum System Pressure: 1-inch wg.
- E. Frame: Hat-shaped, 0.05-inch-thick galvanized sheet steel or 0.063-inch-thick extruded aluminum with welded corners or mechanically attached and mounting flange.
- F. Blades: Multiple single-piece blades, center pivoted, maximum 6-inch width, 0.050-inch-thick aluminum sheet noncombustible, tear-resistant, neoprene-coated fiberglass with sealed edges.
- G. Blade Action: Parallel.
- H. Blade Seals: Neoprene, mechanically locked.
- I. Blade Axles:
1. Material: Galvanized steel or Aluminum.
 2. Diameter: 0.20 inch.
- J. Tie Bars and Brackets: Aluminum or Galvanized steel.
- K. Return Spring: Adjustable tension.
- L. Bearings: Steel ball or synthetic pivot bushings.
- M. Accessories:
1. Adjustment device to permit setting for varying differential static pressure.
 2. Counterweights and spring-assist kits for vertical airflow installations.
 3. Electric actuators.
 4. Chain pulls.

5. Screen Mounting: Front mounted in sleeve.
 - a. Sleeve Thickness: 20 gage minimum.
 - b. Sleeve Length: 6 inches minimum.
6. Screen Mounting: Rear mounted.
7. Screen Material: Galvanized steel or Aluminum.
8. Screen Type: Bird.
9. 90-degree stops.

2.4 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Air Balance; a division of MESTEK, Inc.
 - b. Aire Technologies.
 - c. American Warming and Ventilating; a Mestek Architectural Group company.
 - d. Arrow United Industries.
 - e. Cesco Products; a division of MESTEK, Inc.
 - f. Greenheck Fan Corporation.
 - g. Lloyd Industries, Inc.
 - h. McGill AirFlow LLC.
 - i. Nailor Industries Inc.
 - j. Pottorff.
 - k. Ruskin Company.
 - l. Safe Air – Dowco Products.
 - m. United Enertech.
 - n. Vent Products Co., Inc.
2. Standard leakage rating.
3. Suitable for horizontal or vertical applications.
4. Frames:
 - a. Frame: Hat-shaped, 0.094-inch-thick, galvanized sheet steel.
 - b. Mitered and welded corners.
 - c. Flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:
 - a. Multiple or single blade.
 - b. Parallel- or opposed-blade design.
 - c. Stiffen damper blades for stability.
 - d. Galvanized-steel, 0.064 inch thick.
6. Blade Axles: Galvanized steel.
7. Bearings:

- a. Oil-impregnated bronze.
 - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
- 8. Tie Bars and Brackets: Galvanized steel.
- B. Standard, Aluminum, Manual Volume Dampers:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Warming and Ventilating; a Mestek Architectural Group company.
 - b. Arrow United Industries.
 - c. Cesco Products; a division of MESTEK, Inc.
 - d. Lloyd Industries, Inc.
 - e. McGill AirFlow LLC.
 - f. Nailor Industries Inc.
 - g. Pottorff.
 - h. Ruskin Company.
 - i. Safe Air – Dowco Products.
 - j. United Enertech.
 - k. Vent Products Co., Inc.
 - 2. Standard leakage rating.
 - 3. Suitable for horizontal or vertical applications.
 - 4. Frames: Hat-shaped, 0.10-inch-thick, aluminum sheet channels; frames with flanges for attaching to walls and flangeless frames for installing in ducts.
 - 5. Blades:
 - a. Multiple or single blade.
 - b. Parallel- or opposed-blade design.
 - c. Stiffen damper blades for stability.
 - d. Roll-Formed Aluminum Blades: 0.10-inch-thick aluminum sheet.
 - e. Extruded-Aluminum Blades: 0.050-inch-thick extruded aluminum.
 - 6. Blade Axles: Galvanized steel.
 - 7. Bearings:
 - a. Oil-impregnated bronze.
 - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
 - 8. Tie Bars and Brackets: Aluminum.
- C. Damper Hardware:
 - 1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch-thick zinc-plated steel, and a 3/4-inch hexagon locking nut.
 - 2. Include center hole to suit damper operating-rod size.
 - 3. Include elevated platform for insulated duct mounting.

2.5 CONTROL DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Warming and Ventilating; a Mestek Architectural Group company.
 2. Arrow United Industries.
 3. Carnes Company.
 4. Cesco Products; a division of MESTEK, Inc.
 5. Greenheck Fan Corporation.
 6. Lloyd Industries, Inc.
 7. McGill AirFlow LLC.
 8. Metal Form Manufacturing, Inc.
 9. Nailor Industries Inc.
 10. NCA Manufacturing, Inc.
 11. Pottorff.
 12. Ruskin Company.
 13. Safe Air – Dowco Products.
 14. United Enertech.
 15. Vent Products Co., Inc.
 16. Young Regulator Company.
- B. Low-leakage rating and bearing AMCA's Certified Ratings Seal for both air performance and air leakage.
- C. Frames:
1. Hat shaped.
 2. 0.094-inch-thick, galvanized sheet steel.
 3. Mitered and welded corners.
- D. Blades:
1. Multiple blade with maximum blade width of 6 inches.
 2. Opposed-blade design.
 3. Galvanized-steel or Aluminum.
 4. 0.064 inch thick single skin.
 5. Blade Edging: Closed-cell neoprene.
 6. Blade Edging: Inflatable seal blade edging, or replaceable rubber seals.
- E. Blade Axles: 1/2-inch-diameter; galvanized steel blade-linkage hardware of zinc-plated steel and brass; ends sealed against blade bearings.
1. Operating Temperature Range: From minus 40 to plus 200 deg F.
- F. Bearings:
1. Oil-impregnated bronze.
 2. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
 3. Thrust bearings at each end of every blade.

2.6 FIRE DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Air Balance; a division of MESTEK, Inc.
 2. Aire Technologies.
 3. Arrow United Industries.
 4. Cesco Products; a division of MESTEK, Inc.
 5. CL WARD & Family Inc.
 6. Greenheck Fan Corporation.
 7. NCA Manufacturing, Inc.
 8. Pottorff.
 9. Prefco.
 10. Ruskin Company.
 11. Safe Air – Dowco Products.
 12. United Enertech.
 13. Vent Products Co., Inc.
- B. Type: Dynamic; rated and labeled according to UL 555 by an NRTL.
- C. Closing rating in ducts up to 4-inch wg static pressure class and minimum 2000-fpm velocity.
- D. Fire Rating: 1-1/2 hours.
- E. Frame: Curtain type with blades outside airstream; fabricated with roll-formed, 0.034-inch- thick galvanized steel; with mitered and interlocking corners.
- F. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.
1. Minimum Thickness: 0.05, 0.138 inch or 0.39 inch thick, as indicated, and of length to suit application.
 2. Exception: Omit sleeve where damper-frame width permits direct attachment of perimeter mounting angles on each side of wall or floor; thickness of damper frame must comply with sleeve requirements.
- G. Mounting Orientation: Vertical or horizontal as indicated.
- H. Blades: Roll-formed, interlocking, 0.024-inch-thick, galvanized sheet steel. In place of interlocking blades, use full-length, 0.034-inch-thick, galvanized-steel blade connectors.
- I. Horizontal Dampers: Include blade lock and stainless-steel closure spring.
- J. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.

2.7 TURNING VANES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Aero-Dyne Sound Control Co.
 2. CL WARD & Family Inc.
 3. Ductmate Industries, Inc.
 4. Duro Dyne, Inc.
 5. DynAir; a Carlisle Company.
 6. Elgen Manufacturing.
 7. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.
- C. Manufactured Turning Vanes for Nonmetal Ducts: Fabricate curved blades of resin-bonded fiberglass with acrylic polymer coating; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
- D. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."
- E. Vane Construction: Single wall.

2.8 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CL WARD & Family Inc.
 2. Ductmate Industries, Inc.
 3. Duro Dyne, Inc.
 4. DynAir; a Carlisle Company.
 5. Elgen Manufacturing.
 6. Ventfabrics, Inc.
 7. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Materials: Flame-retardant or noncombustible fabrics.
- C. Coatings and Adhesives: Comply with UL 181, Class 1.
- D. Metal-Edged Connectors: Factory fabricated with a fabric strip 5-3/4 inches wide attached to two strips of 2-3/4-inch-wide, 0.028-inch-thick, galvanized sheet steel or 0.032-inch-thick aluminum sheets. Provide metal compatible with connected ducts.
- E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
1. Minimum Weight: 26 oz./sq. yd.
 2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
 3. Service Temperature: Minus 40 to plus 200 deg F.

- F. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.
 - 1. Minimum Weight: 24 oz./sq. yd.
 - 2. Tensile Strength: 530 lbf/inch in the warp and 440 lbf/inch in the filling.
 - 3. Service Temperature: Minus 50 to plus 250 deg F.
- G. High-Temperature System, Flexible Connectors: Glass fabric coated with silicone rubber.
 - 1. Minimum Weight: 16 oz./sq. yd.
 - 2. Tensile Strength: 285 lbf/inch in the warp and 185 lbf/inch in the filling.
 - 3. Service Temperature: Minus 67 to plus 500 deg F.
- H. Thrust Limits: Combination coil spring and elastomeric insert with spring and insert in compression, and with a load stop. Include rod and angle-iron brackets for attaching to fan discharge and duct.
 - 1. Frame: Steel, fabricated for connection to threaded rods and to allow for a maximum of 30 degrees of angular rod misalignment without binding or reducing isolation efficiency.
 - 2. Outdoor Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 - 3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 - 4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 - 5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 - 6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
 - 7. Coil Spring: Factory set and field adjustable for a maximum of 1/4-inch movement at start and stop.

2.9 FLEXIBLE DUCTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Flexmaster U.S.A., Inc.
 - 2. JP Lamborn Co.
 - 3. McGill AirFlow LLC.
 - 4. Thermaflex; a Flex-Tek Group Company.
 - 5. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Insulated, Flexible Duct: UL 181, Class 1, multiple layers of aluminum laminate supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene vapor-barrier film.
 - 1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
 - 2. Maximum Air Velocity: 4000 fpm.
 - 3. Temperature Range: Minus 20 to plus 210 deg F.
 - 4. Insulation R-value: Comply with ASHRAE/IESNA 90.1.

C. Flexible Duct Connectors:

1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.
2. Non-Clamp Connectors: Adhesive, liquid adhesive plus tape, or adhesive plus sheet metal screws.

2.10 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.
- C. Install backdraft dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.
- D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
 1. Install steel volume dampers in steel ducts.
 2. Install aluminum volume dampers in aluminum ducts.
- E. Set dampers to fully open position before testing, adjusting, and balancing.
- F. Install test holes at fan inlets and outlets and elsewhere as indicated.
- G. Install fire dampers according to UL listing.
- H. Install flexible connectors to connect ducts to equipment.

- I. Connect terminal units to supply ducts directly or with maximum 12-inch lengths of flexible duct. Do not use flexible ducts to change directions.
- J. Connect diffusers to ducts directly or with maximum 60-inch lengths of flexible duct clamped or strapped in place.
- K. Connect flexible ducts to metal ducts with adhesive, liquid adhesive plus tape, or adhesive plus sheet metal screws.
- L. Install duct test holes where required for testing and balancing purposes.
- M. Install thrust limits at centerline of thrust, symmetrical on both sides of equipment. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch movement during start and stop of fans.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:

- 1. Operate dampers to verify full range of movement.
- 2. Inspect locations of access doors and verify that purpose of access door can be performed.
- 3. Operate fire dampers to verify full range of movement and verify that proper heat-response device is installed.
- 4. Inspect turning vanes for proper and secure installation.
- 5. Operate remote damper operators to verify full range of movement of operator and damper.

END OF SECTION 233300

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Rectangular and square ceiling diffusers.
 - 2. Perforated diffusers.
 - 3. Louver face diffusers.
 - 4. Adjustable bar registers and grilles.
 - 5. Fixed face registers and grilles.
- B. Related Sections:
 - 1. Section 089119 "Fixed Louvers" for fixed louvers and wall vents, whether or not they are connected to ducts.
 - 2. Section 233300 "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, include the following:
 - 1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
 - 2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
 - 1. Ceiling suspension assembly members.
 - 2. Method of attaching hangers to building structure.
 - 3. Size and location of initial access modules for acoustical tile.
 - 4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 5. Duct access panels.

- B. Source quality-control reports.

PART 2 - PRODUCTS

2.1 CEILING DIFFUSERS

- A. See Air Device Schedule on mechanical drawings for type, make, model and description.

2.2 SOURCE QUALITY CONTROL

- A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 233713

SECTION 233723 - HVAC GRAVITY VENTILATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof hoods.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 2. AWS D1.3, "Structural Welding Code - Sheet Steel."

1.5 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5 or T-52.
- B. Aluminum Sheet: ASTM B 209 , Alloy 3003 or 5005 with temper as required for forming or as otherwise recommended by metal producer for required finish.
- C. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 zinc coating, mill phosphatized.
- D. Stainless-Steel Sheet: ASTM A 666, Type 304, with No. 4 finish.

- E. Fasteners: Same basic metal and alloy as fastened metal or 300 Series stainless steel unless otherwise indicated. Do not use metals that are incompatible with joined materials.
 - 1. Use types and sizes to suit unit installation conditions.
 - 2. Use Phillips flat, or hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.
- F. Post-Installed Fasteners for Concrete and Masonry: Torque-controlled expansion anchors made from stainless-steel components, with capability to sustain without failure a load equal to 4 times the loads imposed for concrete, or 6 times the load imposed for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
- G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.2 FABRICATION, GENERAL

- A. Factory or shop fabricate gravity ventilators to minimize field splicing and assembly. Disassemble units to the minimum extent as necessary for shipping and handling. Clearly mark units for reassembly and coordinated installation.
- B. Fabricate frames, including integral bases, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
- C. Fabricate units with closely fitted joints and exposed connections accurately located and secured.
- D. Fabricate supports, anchorages, and accessories required for complete assembly.
- E. Perform shop welding by AWS-certified procedures and personnel.

2.3 ROOF HOODS

- A. See Gravity Roof Vent schedule on mechanical drawings for type, model and description.
- B. Factory or shop fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figures 6-6 and 6-7.
- C. Materials: Galvanized-steel sheet, minimum 0.064-inch-thick base and 0.040-inch-thick hood or Aluminum sheet, minimum 0.063-inch-thick base and 0.050-inch-thick hood; suitably reinforced.
- D. Roof Curbs: Galvanized-steel sheet; with mitered and welded corners; 1-1/2-inch-thick, rigid fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to fit roof opening and ventilator base.
 - 1. Configuration: Built-in raised cant and mounting flange.
 - 2. Overall Height: 12 inches.
- E. Insect Screening: Aluminum, 18-by-16 mesh, 0.012-inch or Stainless-steel, 18-by-18 mesh, 0.009-inch wire.

F. Galvanized-Steel Sheet Finish:

1. Surface Preparation: Clean surfaces of dirt, grease, and other contaminants. Clean welds, mechanical connections, and abraded areas and repair galvanizing according to ASTM A 780. Apply a conversion coating suited to the organic coating to be applied over it.
2. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply an air-dried primer immediately after cleaning and pretreating.
3. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil for topcoat and an overall minimum dry film thickness of 2 mils.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range.

G. Capacities and Characteristics:

1. See Gravity Roof Vent schedule on mechanical drawings for capacities and characteristics.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install gravity ventilators level, plumb, and at indicated alignment with adjacent work.
- B. Install gravity ventilators with clearances for service and maintenance.
- C. Install perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- D. Install concealed gaskets, flashings, joint fillers, and insulation as installation progresses. Comply with Section 079200 "Joint Sealants" for sealants applied during installation.
- E. Label gravity ventilators according to requirements specified in Section 230553 "Identification for HVAC Piping and Equipment."
- F. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
- G. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.

3.2 CONNECTIONS

- A. Duct installation and connection requirements are specified in Section 233113 "Metal Ducts". Drawings indicate general arrangement of ducts and duct accessories.

3.3 ADJUSTING

- A. Adjust damper linkages for proper damper operation.

END OF SECTION 233723

SECTION 238126 - SPLIT-SYSTEM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes split-system air-conditioning and heat-pump units consisting of separate evaporator-fan and compressor-condenser components.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For split-system air-conditioning units to include in emergency, operation, and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Filters: One set(s) for each air-handling unit.

2. Gaskets: One set(s) for each access door.
3. Fan Belts: One set(s) for each air-handling unit fan.

1.7 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE Compliance:
 1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
 2. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - "Procedures," and Section 7 - "Construction and System Start-up."
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

1.8 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork are specified in Section 033000 "Cast-in-Place Concrete."
- B. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.
 1. Warranty Period:
 - a. For Compressor: Five year(s) from date of Substantial Completion.
 - b. For Parts: One year(s) from date of Substantial Completion.
 - c. For Labor: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. See Split System Air Conditioning Unit Schedule on mechanical drawings for type, make, model and description.

2.2 INDOOR UNITS 5 TONS OR LESS

A. Concealed Evaporator-Fan Components:

1. Chassis: Galvanized steel with flanged edges, removable panels for servicing, and insulation on back of panel.
2. Insulation: Faced, glass-fiber duct liner.
3. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 206/110.
4. Water Coil: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch; leak tested to 300 psig underwater; with a two-position control valve.
5. Electric Coil: Helical, nickel-chrome, resistance-wire heating elements; with refractory ceramic support bushings, automatic-reset thermal cutout, built-in magnetic contactors, manual-reset thermal cutout, airflow proving device, and one-time fuses in terminal box for overcurrent protection.
6. Fan: Forward-curved, double-width wheel of galvanized steel; directly connected to motor.
7. Fan Motors:
 - a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
 - b. Multitapped, multispeed with internal thermal protection and permanent lubrication.
 - c. Wiring Terminations: Connect motor to chassis wiring with plug connection.
8. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
9. Filters: Permanent, cleanable.
10. Condensate Drain Pans:
 - a. Fabricated with one percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and humidifiers, and to direct water toward drain connection.
 - 1) Length: Extend drain pan downstream from leaving face to comply with ASHRAE 62.1.
 - 2) Depth: A minimum of 2 inches deep.
 - b. Double-wall, galvanized-steel sheet with space between walls filled with foam insulation and moisture-tight seal.
 - c. Drain Connection: Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on both ends of pan.
 - 1) Minimum Connection Size: NPS 1.
 - d. Provide condensate pump as required for condensate drainage, wired into unit fan start.

2.3 OUTDOOR UNITS 5 TONS OR LESS

A. Air-Cooled, Compressor-Condenser Components:

1. Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.
2. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.
 - a. Compressor Type: Scroll.
 - b. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
 - c. Refrigerant Charge: R-410A.
 - d. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 206/110.
3. Heat-Pump Components: Reversing valve and low-temperature-air cutoff thermostat.
4. Fan: Aluminum-propeller type, directly connected to motor.
5. Motor: Permanently lubricated, with integral thermal-overload protection.
6. Low Ambient Kit: Permits operation down to 45 deg F.
7. Mounting Base: Polyethylene.

2.4 ACCESSORIES

- A. Thermostat: Low voltage with subbase to control compressor and evaporator fan.
- B. Automatic-reset timer to prevent rapid cycling of compressor.
- C. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.
- D. Drain Hose: For condensate.

2.5 CAPACITIES AND CHARACTERISTICS

- A. See Split System Air Conditioning Unit Schedule on mechanical drawings for capacities and characteristics.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install units level and plumb.
- B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.
- C. Equipment Mounting:
 1. Install ground-mounted, compressor-condenser components on concrete equipment bases.

2. Comply with requirements for vibration isolation devices specified in Section 230548.13 "Vibration Controls for HVAC."

- D. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

- A. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.
- B. Duct Connections: Duct installation requirements are specified in Section 233113 "Metal Ducts." Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Section 233300 "Air Duct Accessories."

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Remove and replace malfunctioning units and retest as specified above.
- E. Prepare test and inspection reports.

3.4 STARTUP SERVICE

- A. Perform startup service.
 1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 238126

SECTION 26 00 10 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL

- A. Basic Requirements: The Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- B. General Provisions: Provide all labor, materials, equipment, and incidentals required to make ready for use complete electrical systems as specified herein and shown on the drawings.
- C. Provide and Install: The word "provide" where used on the Drawings or in the Specifications shall mean "furnish, install, mount, connect, test, complete, and make ready for operation". The word "install" where used on the Drawings or in the Specifications shall mean "mount, connect, test, complete, and make ready for operation". Perform work required by, and in accordance with, the Contract Documents.
- D. Installation: Provide and place in satisfactory condition, ready for proper operation, raceways, wires, cables, and other material needed for all complete electrical systems required by the Contract Documents. Additional raceways and wiring shall be provided to complete the installation of the specific equipment provided. Include auxiliaries and accessories for complete and properly operating systems. Provide electrical systems and accessories to comply with the NEC, state and local codes and ordinances. It is the intent of these Specifications that the electrical systems be suitable in every way for the use intended. Material and work which is incidental to the work of this Contract shall be provided at no additional cost to the Contract.
- E. Field Connections: Provide field connections to remote equipment and control panels provided under other Divisions of these Specifications. Install field connections to "packaged" equipment provided under other Divisions of these Specifications.

1.2 SCOPE OF WORK

- A. General: Provide labor, materials, permits, inspections and re-inspection fees, tools, equipment, transportation, insurance, temporary protection, temporary power and lighting, supervision and incidental items essential for proper installation and operation of the Electrical systems indicated in the Contract Documents. Provide materials not specifically mentioned or indicated but which are usually provided or are essential for proper installation and operation of the Electrical systems indicated in the contract documents.
- B. Notices: Give notices, file Plans, pay fees, and obtain permits and approvals from authorities having jurisdiction. Include all fees in the Bid Price.

1.3 INTERPRETATION OF DRAWINGS

- A. General: The Drawings are diagrammatic and are not intended to show exact locations of Raceway runs, outlet boxes, junction boxes, pull boxes, etc. The locations of equipment, appliances, fixtures, Raceways, outlets, boxes and similar devices shown on the Drawings are approximate only. Exact locations shall be determined and coordinated in the field. The right is reserved to change, without additional cost, the location of any outlet within the same room or general area before it is permanently installed. Obtain all information relevant to the placing of electrical work and in case of interference with other work, proceed as directed by the Architect.
- B. Discrepancies: Notify the Architect of any discrepancies found during construction of the project. The Architect will provide written instructions as to how to proceed with that portion of work. If a conflict exists between the Contract Documents and an applicable code or standard, the most stringent requirement shall apply.
- C. Wiring: Each three-phase circuit shall be run in a separate Raceway unless otherwise shown on the Drawings. Unless otherwise accepted by the Architect, Raceway shall not be installed exposed. Where circuits are shown as "home runs" all necessary fittings, supports, and boxes shall be provided for a complete raceway installation.
- D. Layout: Circuit layouts are not intended to show the number of fittings, or other installation details. Connections to equipment shall be made as required, and in accordance with the accepted shop and manufacturer's setting drawings.
- E. Coordination: Coordinate final equipment locations with drawings or other disciplines. Layout before installation so that all trades may install equipment in available space. Provide coordination as required for installation in a neat and workmanlike manner.

1.4 EQUIPMENT SIZE AND HANDLING

- A. Coordination: Investigate each space in the structure through which equipment must pass to reach its final location. If necessary, ship the equipment in sections of specific sizes to permit the passing through the necessary areas within the structure.
- B. Handling: Equipment shall be kept upright at all times. When equipment has to be tilted for ease of passage through restricted areas during transportation, the manufacturer shall be required to brace the equipment suitably, to insure that the tilting does not impair the functional integrity of the equipment.

1.5 RECORD DRAWINGS

- A. The Contractor shall provide "As-Built Documents". The "As-Built" drawings shall accurately reflect installed work.

1.6 CODES, FEES, AND STANDARDS

- A. The codes, standards and practices listed herein generally apply to the entire project and specification sections. Other codes, standards or practices that are more specific will be referenced within a particular specification.
- B. All materials and types of construction covered in the specifications will be required to meet or exceed applicable standards of manufacturer, testing, performance, and installation according to the requirements of UL, ANSI, NEMA, IEEE, and NEC referenced documents where indicated and the manufacturer's recommended practices. Requirements indicated on the contract documents that exceed but are not contrary to governing codes shall be followed.
- C. The installation shall comply with the governing state and local codes or ordinances. The completed electrical installation shall be inspected and certified by applicable agencies that it is in compliance with codes.
- D. Materials and equipment shall be new and free of defects, and shall be U.L. listed, bear the U.L. label or be labeled or listed with an approved, nationally recognized Electrical Testing Agency. Where no labeling or listing service is available or desired for certain types of equipment, test data shall be submitted to validate that equipment meets or exceeds available standards.

1.7 SUPERVISION OF THE WORK

- A. Provide one field superintendent who has had a minimum of four (4) years previous successful experience on projects of comparable sizes, type and complexity. The Superintendent shall be present at all times when work is being performed. At least one member of the Electrical Contracting Firm shall hold a State Master Certificate of Competency.

1.8 COORDINATION

- A. General: Compare drawings and specifications with those of other trades and report any discrepancies between them to the Architect. Obtain from the Architect written instructions to make the necessary changes in any of the affected work. Work shall be installed in cooperation with other Trades installing interrelated work. Before installation, Trades shall make proper provisions to avoid interferences in a manner approved by the Architect.
- B. Provide all required coordination and supervision where work connects to or is affected by work of others, and comply with all requirements affecting this Division. Work required under other divisions, specifications or drawings to be performed by this Division shall be coordinated with the Contractor and such work performed at no additional cost to Owner.
- C. Obtain a complete set of Contract Documents from Owner's Authorized Representative or Contractor for all areas of work and include all electrical work in bid price whether included in Division 26 Contract Documents or not.

- D. Secure approved shop drawings from all required disciplines and verify final electrical characteristics before roughing power feeds to any equipment. When electrical data on approved shop drawings differs from that shown or called for in Construction Documents, make adjustments to the wiring, disconnects, and branch circuit protection to match that required for the equipment installed.
- E. Damage from interference caused by inadequate coordination shall be corrected at no additional cost to the Owner.
- F. Adjustments: Locations of raceway and equipment shall be adjusted to accommodate the work with interferences anticipated and encountered. Determine the exact routing and location of systems prior to fabrication or installation.
- G. Priorities: Lines which pitch shall have the right of way over those which do not pitch. For example, plumbing drains shall normally have the right of way. Lines whose elevations cannot be changed shall have the right of way over lines whose elevations can be changed.
- H. Modifications: Offsets and changes of direction in raceway systems shall be made to maintain proper headroom and pitch of sloping lines whether or not indicated on the drawings. Provide elbows, boxes, etc., as required to allow offsets and changes to suit job conditions.
- I. Replacement: Work shall be installed in a way to permit removal (without damage to other parts) of other system components provided under this Contract requiring periodic replacement or maintenance. Raceway shall be arranged in a manner to clear the openings of swinging overhead access doors as well as ceiling tiles.
- J. Layout: The Contract Drawings are diagrammatic only intending to show general runs and locations of raceway and equipment, and not necessarily showing required offsets, details and accessories and equipment to be connected. Work shall be accurately laid out with other Trades to avoid conflicts and to obtain a neat and workmanlike installation, which will afford maximum accessibility for operation, maintenance and headroom.
- K. Contract Conflicts: Where discrepancies exist in the Scope of Work as to what Trade provides items such as starters, disconnects, flow switches, etc. such conflicts shall be coordinated between the divisions involved. It is the intent of the Contract Documents that all work shall be provided complete as one bid price.
- L. Drawing Conflicts: Where drawing details, plans or specification requirements are in conflict and where sizes of the same item run are shown to be different within the contract documents, the most stringent requirement shall be included in the Contract. Systems and equipment called for in the specification or as shown on the drawings shall be provided as if it was required by both the drawings and specifications. Prior to ordering or installation of any portion of work, which appears to be in conflict, such work shall be brought to Architect's attention for direction as to what is to be provided.
- M. It is the responsibility of this Contractor to coordinate the exact required location of floor outlets, floor ducts, floor stub-ups, etc. with Owner's Authorized Representative and Designer (and receive their approval) prior to rough-in. Locations indicated in Contract Documents are only approximate locations.

- N. The Contract Documents describe specific sizes of switches, breakers, fuses, Raceways, conductors, motor starters and other items of wiring equipment. These sizes are based on specific items of power consuming equipment (heaters, lights, motors for fans, compressors, pumps, etc.). Coordinate the requirements of each load with each load's respective circuitry shown and with each load's requirements as noted on its nameplate data and manufacturer's published electrical criteria. Adjust circuit breaker, fuse, Raceway, and conductor sizes to meet the actual requirements of the equipment being provided and installed and change from single point to multiple points of connection (or vice versa) to meet equipment requirements. Changes shall be made at no additional cost to the Owner.
- O. Working Clearances: Minimum working clearances about electrical equipment shall be as referenced in the applicable edition NEC Article 110, and shall include equipment installed in ceiling spaces.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Specified Method: Where several brand names, make or manufacturers are listed as acceptable each shall be regarded as equally acceptable, based on the design selection but each must meet all specification requirements. Where a manufacturer's model number is listed, this model shall set the standard of quality and performance required. Where no brand name is specified, the source and quality shall be subject to Engineer's review and acceptance. Where manufacturers are listed, one of the listed manufacturers shall be submitted for acceptance. No substitutions are permitted.
- B. Certification: When a product is specified to be in accordance with a trade association or government standard requested by the Engineer, Contractor shall provide a certificate that the product complies with the referenced standard. Upon request of Engineer, Contractor shall submit supporting test data to substantiate compliance.
- C. Basis of Bid: Each bidder represents that his bid is based upon the manufacturer's, materials, and equipment described in the Contract Documents.
- D. Space Requirements: Equipment or optional equipment shall conform to established space requirements within the project. Equipment which does not meet space requirements, shall be replaced at no additional expense to the Contract. Modifications of related systems shall be made at no additional expense to the Contract. Submit modifications to the Architect/Engineer for acceptance.

2.2 SHOP DRAWINGS

- A. General: Shop drawings shall be submitted for every item listed within the Submittals section each individual specification section. One copy shall be submitted to the engineer prior to ordering equipment. Refer to Basis of approval paragraph.

- B. Responsibility: It is the Contractors responsibility to provide material in accordance with the plans and specifications. Material not provided in accordance with the plans and specifications shall be removed and replaced at the Contractors expense.
- C. Official Record: The shop drawing submittal shall become the official record of the materials to be installed. If materials are installed which do not correspond to the record submittal they shall be removed from the project without any additional cost or delays in construction completion.
- D. Basis of Review: Approval is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Contractor is responsible for quantities, dimensions, fabrication processes, and construction techniques.
- E. Responsibility: The responsibility that dimensions are confirmed and correlated with proper coordination of other trades shall be included as part of the Contract Documents. The responsibility and the necessity of providing materials and workmanship required by the Specifications and Drawings which may not be indicated on the shop drawings shall be included as part of the Contract Documents. The Contractor is responsible for any delays in job progress occurring directly or indirectly from late submissions or re-submissions of shop drawings, product data, or samples.
- F. Ordering Equipment: No material shall be ordered or shop work started until the Engineer has officially received the shop drawings record submittal and has formally released the Contractor for submittal requirements.

2.3 EQUIPMENT, MATERIALS, AND SUPPORTS

- A. General: Each item of equipment or material shall be manufactured by a company regularly engaged in the manufacturer of the type and size of equipment, shall be suitable for the environment in which it is to be installed, shall be approved for its purpose, environment, and application, and shall bear the UL label.
- B. Installation Requirements: Each item of equipment or material shall be installed in accordance with instructions and recommendations of the manufacturer, however, the methods shall not be less stringent than specified herein.
- C. Required Accessories: Provide all devices and materials, such as expansion bolts, foundation bolts, screws, channels, angles, and other attaching means, required to fasten enclosures, raceways, and other electrical equipment and materials to be mounted on structures which are existing or new.
- D. Protection: Electrical equipment shall at all times during construction be adequately protected against mechanical injury or damage by the elements. Equipment shall be stored in dry permanent shelters. If apparatus has been damaged, such damage shall be repaired at no additional cost or time extension to the Contract. If apparatus has been subject to possible injury, it shall be thoroughly cleaned, dried out and put through tests as directed by the Manufacturer and Engineer, or shall be replaced, if directed by the Engineer, at no additional cost to the Contract.

2.4 IDENTIFICATION OF EQUIPMENT

- A. General: Electrical items shall be identified as specified in the Contract Documents. Such identification shall be in addition to the manufacturer's nameplates and shall serve to identify the item's function and the equipment or system, which it serves or controls. Refer to Identification Section of the specifications for additional information.

2.5 CONCRETE PADS

- A. General: Provide reinforced concrete pads for floor mounted electrical equipment. Unless otherwise noted, pads shall be nominal four (4) inches high and shall exceed dimensions of equipment being set on them, including future sections, by six (6) inches on all sides, except when equipment is flush against a wall, then the side or sides against the wall shall be flush with the equipment. Chamfer top edges 1/2". Trowel surfaces smooth. Reinforce pads with #5 reinforcing bars at 24" centers each way, unless specifically detailed on drawings.

2.6 SURFACE MOUNTED EQUIPMENT

- A. General: Surface mounted fixtures, outlets, cabinets, panels, etc. shall have a factory-applied finish or shall be painted as accepted by Engineer. Raceways and fittings, where allowed to be installed surface mounted, shall be painted to match the finish on which it was installed. Paint shall be in accordance with other applicable sections of these specifications.

2.7 CUTTING AND PATCHING

- A. Core Drilling: The Contractor shall be responsible for core drilling as required for work under this section, but in no case shall the Contractor cut into or weld onto any structural element of the project without the written approval of the Architect.
- B. Cutting and Patching: Cutting, rough patching and finish patching shall be provided as specified in the contract documents. Cutting and patching shall be performed in a neat and workmanlike manner. Upon completion, the patched area shall match adjacent surfaces.
- C. Openings and Sleeves: Locate openings required for work performed under this section. Provide sleeves, guards or other accepted methods to allow passage of items installed under this section.
- D. Roof Penetration: Provide roofer with pitch pans, fittings, etc., required for electrical items which penetrate the roof. Roof penetrations are to be waterproofed in such a manner that roofing guarantees are fully in force. Roof penetrations shall be coordinated with other Trades to ensure that roof warranty is not invalidated.

2.8 SLEEVES AND FORMS FOR OPENINGS

- A. Sleeves: Provide sleeves for Raceways penetrating floors, walls, partitions, etc. Locate necessary slots for electrical work and form before concrete is poured. Watertight sleeves shall be line seal type WS. Fire rated partition sleeves shall be mild steel. Sleeves shall be Schedule 40 PVC or galvanized rigid steel unless specifically noted otherwise. Size shall be one standard diameter larger than pipe being installed or of a larger diameter to below 1/4" minimum clearance.
- B. Forms: Provide boxed out forms for Raceway penetrations only where allowed by the Architect. Fill opening after Raceway installation, with equivalent material.

2.9 SERVICE AND METERING

- A. Service: Make arrangements with the Utility Company for obtaining a complete service. Pay charges and provide labor and material for the service.
- B. Fees: Contact the Utility Company to determine if any fees, charges or costs will be due the Company, as required for temporary power, permanent power, installations, hook-ups, etc. This fee, charge or cost shall be included in the bid price.
- C. Payment: Pay for required licenses, fees and inspections. Include costs in the proposed construction cost submission. These costs shall include but not be limited to applicable taxes, permits, necessary notices, certificates and costs required to obtain same.

2.10 TEMPORARY LIGHT AND POWER

- A. Capacity: Provide capacity from new temporary service. Make arrangements with the Owner for temporary service and pay all related expenses. Temporary light and power shall be provided constantly during the project dependent upon Owner's safety requirements.
- B. Lighting: Temporary light shall be based on one 200 watt lamp covering each 1,000 square foot of floor area in the building. Each room 100 square foot and over shall have a minimum of one 100-watt lamp with guards. Provisions are to be made for electric welders, if required.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- A. General: The installation of materials and equipment shall be performed in a neat, workmanlike and timely manner by an adequate number of craftsmen knowledgeable of the requirements of the Contract Documents. They shall be skilled in the methods and craftsmanship needed to produce a quality level of workmanship. Personnel who install materials and equipment shall be qualified by training and experience to perform their assigned tasks.

- B. **Acceptable Workmanship:** Acceptable workmanship is characterized by first-quality appearance and function, conforming to applicable standards of building system construction, and exhibiting a high degree of quality and proficiency which is judged by the Architect as equivalent or better than that ordinarily produced by qualified industry tradesmen.
- C. **Performance:** Personnel shall not be used in the performance of the installation of material and equipment who, in the opinion of the Architect, are deemed to be careless or unqualified to perform the assigned tasks. Material and equipment installations not in compliance with the Contract Documents, or installed with substandard workmanship and not acceptable to the Architect, shall be removed and reinstalled by qualified craftsmen, at no change in the contract price.

3.2 PROTECTION AND CLEAN UP

- A. **Protection and Restoration:** Suitably protect equipment provided under this Division during construction. Restore damaged surfaces and items to "like new" condition before a request for substantial completion inspection.
- B. **Handling:** Materials shall be properly protected and Raceway openings shall be temporarily closed by the Contractor to prevent obstruction and damage. Post notice prohibiting the use of systems provided under this Contract, prior to completion of work and acceptance of systems by the Owner's representative. The Contractor shall take precautions to protect his materials from damage and theft.
- C. **Safeguards:** The Contractor shall furnish, place and maintain proper safety guards for the prevention of accidents that might be caused by the workmanship, materials, equipment or systems provided under this contract.
- D. **Cleanup:** Keep the job site free from debris and rubbish. Remove debris and rubbish from the site and leave premises in clean condition on a daily basis.

3.3 SYSTEMS GUARANTEE

- A. **General:** Provide a one-year guarantee. This guarantee shall be by the Contractor to the Owner for any defective workmanship or material, which has been provided under this Contract at no cost to the Owner for a period of one year from the date of substantial completion of the System.

3.4 SPECIAL CONSIDERATIONS

- A. Comply with special requirements imposed at site by Owner. This may include badging of employees, prohibition of smoking, special working hours, or special working conditions.

END OF SECTION 26 00 10

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Copper building wire rated 600 V or less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cerro Wire LLC.
 - 2. Encore Wire Corporation.
 - 3. General Cable Technologies Corporation.
 - 4. Okonite Company (The).
 - 5. Southwire Company.
- C. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

2. RoHS compliant.
 3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- E. Conductor Insulation:
1. Type THHN and Type THWN-2: Comply with UL 83.

2.2 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C. VFD Output Circuits: Stranded for all sizes.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN/THWN-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions: Type THHN/THWN-2, single conductors in raceway.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- E. Exposed Branch Circuits: Type THHN/THWN-2, single conductors in raceway.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.

- G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- H. VFD Output Circuits: Type TC-ER cable with braided shield.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 26 05 29 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 26 05 53 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 07 84 13 "Penetration Firestopping."

3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 2. Perform each of the following visual and electrical tests:
 - a. Inspect exposed sections of conductor and cable for physical damage.
 - b. Inspect compression-applied connectors for correct cable match and indentation.
 - c. Inspect for correct identification.
 - d. Inspect cable jacket and condition.
 - e. Insulation-resistance test on each conductor for ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.
 - f. Continuity test on each conductor and cable.
 - g. Uniform resistance of parallel conductors.
- B. Cables will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements.
 - 3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

END OF SECTION 26 05 19

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes grounding and bonding systems and equipment, plus the following special applications:
 - 1. Ground bonding common with lightning protection system.
 - 2. Foundation steel electrodes.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data:
 - 1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
 - a. Plans showing as-built, dimensioned locations of grounding features, including the following:
 - 1) Test wells.
 - 2) Ground rods.
 - 3) Ground rings.
 - 4) Grounding arrangements and connections for separately derived systems.
 - b. Instructions for periodic testing and inspection of grounding features at test wells.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Advanced Lightning Technology, Ltd.
 - 2. Burndy; Part of Hubbell Electrical Systems.
 - 3. Dossert; AFL Telecommunications LLC.
 - 4. ERICO International Corporation.
 - 5. Fushi Copperweld Inc.
 - 6. Galvan Industries, Inc.; Electrical Products Division, LLC.
 - 7. Harger Lightning & Grounding.
 - 8. ILSCO.
 - 9. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - 10. Robbins Lightning, Inc.
 - 11. SIEMENS Industry, Inc.; Energy Management Division.
 - 12. Thomas & Betts Corporation; A Member of the ABB Group.

2.3 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
 - 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper. See details on drawings.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- C. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
- D. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.
- E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- F. Cable Tray Ground Clamp: Mechanical type, zinc-plated malleable iron.
- G. Conduit Hubs: Mechanical type, terminal with threaded hub.
- H. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.
- I. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.
- J. Water Pipe Clamps: U-bolt type with malleable-iron clamp and copper ground connector rated for direct burial].

2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet.
- B. Ground Plates: 1/4 inch thick, hot-dip galvanized.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 4/0 AWG minimum. Bury at least 24 inches below grade.
- C. Grounding Bus: Install in electrical and communications equipment rooms, as indicated.
- D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.
- B. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.4 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.
- C. Metallic Fences: Comply with requirements of IEEE C2.
 1. Grounding Conductor: Bare, tinned copper, not less than No. 8 AWG.
 2. Gates: Shall be bonded to the grounding conductor with a flexible bonding jumper.
 3. Barbed Wire: Strands shall be bonded to the grounding conductor.

3.5 FENCE GROUNDING

- A. Fence Grounding: Install at maximum intervals of 750 feet.
 - a. Gates and Other Fence Openings: Ground fence on each side of opening.
 - 1) Bond metal gates to gate posts.

- 2) Bond across openings, with and without gates, except at openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.
- B. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
- C. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
- D. Bonding to Lightning-Protection System: If fence terminates at lightning-protected building or structure, ground the fence and bond the fence grounding conductor to lightning-protection down conductor or lightning-protection grounding conductor, complying with NFPA 780.

3.6 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
- C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 2. Use exothermic welds for all below-grade connections.
 3. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- D. Test Wells: Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
- E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

F. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

G. Ground Ring: Install a grounding conductor extending around the perimeter of building.

H. Concrete-Encased Grounding Electrode (Ufer Ground): Fabricate according to NFPA 70; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.

I. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include

observations of weather and other phenomena that may affect test results.
Describe measures taken to improve test results.

- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 26 05 26

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Steel slotted support systems.
 - 2. Aluminum slotted support systems.
 - 3. Conduit and cable support devices.
 - 4. Structural steel for fabricated supports and restraints.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rated capacities and furnished specialties and accessories.
- B. Shop Drawings: Signed and sealed by a qualified professional engineer. For fabrication and installation details for electrical hangers and support systems.
 - 1. Hangers. Include product data for components.
 - 2. Slotted support systems.
 - 3. Equipment supports.
 - 4. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
- C. Delegated-Design Submittal: For hangers and supports for electrical systems.
 - 1. Include design calculations and details of hangers.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design hanger and support system.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
- B. Aluminum Slotted Support Systems: Extruded-aluminum channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
- C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 05 50 00 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
 - 1. NECA 1.
 - 2. NECA 101
 - 3. NECA 102.
 - 4. NECA 105.
 - 5. NECA 111.
- B. Comply with requirements in Section 07 84 13 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.
- C. Comply with requirements for raceways and boxes specified in Section 26 05 33 "Raceways and Boxes for Electrical Systems."
- D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

- E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
- F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

3.3 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Anchor equipment to concrete base.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 05 29

SECTION 26 05 33 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Metal conduits and fittings.
 - 2. Non-Metallic conduits and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Boxes, enclosures, and cabinets.
 - 5. Handholes and boxes for exterior underground cabling.
- B. Related Requirements:
 - 1. Section 07 84 13 "Penetration Firestopping" for firestopping at conduit and box entrances.

1.3 ACTION SUBMITTALS

- A. Product Data: For all products

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

- A. Metal Conduit:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. GRC: Comply with ANSI C80.1 and UL 6.
 - 3. PVC-Coated Steel Conduit:
 - a. Comply with NEMA RN 1.
 - b. Coating Thickness: 0.040 inch, minimum.
 - 4. EMT: Comply with ANSI C80.3 and UL 797.
 - 5. FMC: Comply with UL 1.

6. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings:

1. Comply with NEMA FB 1 and UL 514B.
2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fittings, General: Listed and labeled for type of conduit, location, and use.
4. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
5. Fittings for EMT: Steel or die cast. Setscrew or compression.
6. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
7. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

- C. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:

1. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

B. Nonmetallic Fittings:

1. Fittings, General: Listed and labeled for type of conduit, location, and use.
2. Fittings for ENT: Comply with NEMA TC 3; match to conduit or tubing type and material.
3. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 or Type 3R unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- B. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

- C. Wireway Covers: Screw-cover type unless otherwise indicated.
- D. Finish: Manufacturer's standard enamel finish.

2.4 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, Type FD, with gasketed cover.
- D. Metal Floor Boxes:
 - 1. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- F. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, with gasketed cover.
- G. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- H. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- I. Cabinets:
 - 1. NEMA 250, Type 1 or Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.
 - 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.5 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
 - 1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
 - 2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
 - 1. Standard: Comply with SCTE 77.
 - 2. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
 - 3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
 - 4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 - 5. Cover Legend: Molded lettering, "Electric" or "Communications".
 - 6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed Conduit: GRC.
 - 2. Concealed Conduit, Aboveground: GRC.
 - 3. Underground Conduit: RNC, Type EPC-40-PVC.
 - 4. Connection to Vibrating Equipment: LFMC.
 - 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 - 3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
 - a. Loading area.
 - b. BOH Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 5. Connection to Vibrating Equipment: FMC, except use LFMC in damp or wet locations.
 - 6. Damp or Wet Locations: GRC.
 - 7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.

3.2 INSTALLATION

- A. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for hangers and supports.
- B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.
- D. Do not fasten conduits onto the bottom side of a metal deck roof.
- E. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- F. Complete raceway installation before starting conductor installation.
- G. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- H. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- I. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.
- J. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- K. Support conduit within 12 inches of enclosures to which attached.
- L. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Arrange raceways to keep a minimum of 1 inch of concrete cover in all directions.
 - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
 - 5. Change from RNC to GRC before rising above floor.
- M. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

- N. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- O. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- P. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- Q. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- R. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- S. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- T. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- U. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- V. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Conduit extending from interior to exterior of building.
 - 4. Conduit extending into pressurized duct and equipment.
 - 5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
 - 6. Where otherwise required by NFPA 70.
- W. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- X. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

- Y. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- Z. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- AA. Locate boxes so that cover or plate will not span different building finishes.
- BB. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- CC. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- DD. Set metal floor boxes level and flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:
 - 1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 31 20 00 "Earth Moving" for pipe less than 6 inches in nominal diameter.
 - 2. Install backfill as specified in Section 31 20 00 "Earth Moving."
 - 3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 31 20 00 "Earth Moving."
 - 4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
 - 5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
 - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
 - 6. Underground Warning Tape: Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.
- D. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 07 84 13 "Penetration Firestopping."

3.6 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 26 05 33

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Color and legend requirements for raceways, conductors, and warning labels and signs.
 - 2. Labels.
 - 3. Tapes and stencils.
 - 4. Signs.
 - 5. Paint for identification.
 - 6. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Comply with NFPA 70E and Section 26 05 74 for arc-flash warning labels.
- F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

2.2 COLOR AND LEGEND REQUIREMENTS

- A. Raceways and Cables Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- B. Color-Coding for Phase Identification, 600 V or Less: Use colors listed below for ungrounded conductors.
 - 1. Colors for 208/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - 2. Colors for 480/277-V Circuits:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.
 - 3. Color for Neutral: White or gray.
 - 4. Color for Equipment Grounds: Bare copper, Green or Green with a yellow stripe.
 - 5. Colors for Isolated Grounds: Green with white stripe.
- C. Raceways and Cables Carrying Circuits at More Than 600 V:
 - 1. Black letters on an orange field.
 - 2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."
- D. Warning Label Colors:
 - 1. Identify system voltage with black letters on an orange background.
- E. Warning labels and signs shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."
- F. Equipment Identification Labels:
 - 1. Black letters on a white field.

2.3 LABELS

- A. Self-Adhesive Labels: Thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. Minimum Nominal Size:
 - a. 1-1/2 by 6 inches for raceway and conductors.
 - b. 3-1/2 by 5 inches for equipment.
- B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- C. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.
- D. Tape and Stencil: 4-inch-wide black stripes on 10-inch centers placed diagonally over orange background and are 12 inches wide. Stop stripes at legends.
- E. Floor Marking Tape: 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.
- F. Underground-Line Warning Tape:
 1. Tape:
 - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
 2. Color and Printing:
 - a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
 - b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE" .
 - c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".

2.4 SIGNS

- A. Laminated Acrylic or Melamine Plastic Signs:
 1. Engraved legend.
 2. Thickness:
 - a. For signs up to 20 sq. in., minimum 1/16 inch thick.
 - b. For signs larger than 20 sq. in., 1/8 inch thick.
 - c. Engraved legend with black letters on white face.

2.5 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.
- G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.
 - 1. Secure tight to surface of conductor, cable, or raceway.
- H. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.
 - 1. Secure tight to surface of conductor, cable, or raceway.

- I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
- J. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions.
- K. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.
- L. Accessible Fittings for Raceways: Identify the covers of each junction and pull box of the following systems with the wiring system legend and system voltage. System legends shall be as follows:
 - 1. "EMERGENCY POWER."
 - 2. "POWER."
 - 3. "UPS."
- M. Self-Adhesive Labels:
 - 1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
 - 2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
- N. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.
- O. Heat-Shrink, Preprinted Tubes: Secure tight to surface at a location with high visibility and accessibility.
- P. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.
- Q. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.
 - 1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.
- R. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.
- S. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's written instructions.
- T. Underground Line Warning Tape:
 - 1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade.

U. Laminated Acrylic or Melamine Plastic Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high sign; where two lines of text are required, use labels 2 inches high.

3.3 IDENTIFICATION SCHEDULE

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.
- C. Raceways: Identify with self-adhesive raceway labels. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- D. Conductors: For conductors in vaults, pull and junction boxes, manholes, and handholes, use self-adhesive labels to identify the phase.
- E. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
- F. Workspace Indication: Apply floor marking tape to finished surfaces. Show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- G. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.
- H. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels
- I. Arc Flash Warning Labeling: Self-adhesive labels.
- J. Operating Instruction Signs: Self-adhesive labels
- K. Emergency Operating Instruction Signs: Laminated acrylic or melamine plastic signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions.
- L. Equipment Identification Labels:
 1. Indoor Equipment: Laminated acrylic or melamine plastic sign.
 2. Outdoor Equipment: Laminated acrylic or melamine sign.
 3. Equipment to Be Labeled: All equipment.

END OF SECTION 26 05 53

SECTION 26 09 23 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Photocells
 - 2. Indoor occupancy and vacancy sensors.
 - 3. Switchbox-mounted occupancy sensors.
 - 4. Outdoor motion sensors.
 - 5. Lighting relays

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Show installation details for the following:
 - a. Occupancy sensors.
 - b. Vacancy sensors.
 - 2. Interconnection diagrams showing field-installed wiring.
 - 3. Include diagrams for power, signal, and control wiring.
- C. Field quality-control reports.
- D. Sample Warranty: For manufacturer's warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data

1.5 WARRANTY

- A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.

- 1. Warranty Period: Two year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PHOTOCELLS

- A. Manufacturers: See cut-sheets at end of this Section.

2.2 INDOOR OCCUPANCY AND VACANCY SENSORS

- A. Manufacturers: See cut-sheets at end of this Section.

2.3 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

- A. Manufacturers: See cut-sheets at end of this Section.

2.4 OUTDOOR MOTION SENSORS

- A. Manufacturers: See cut-sheets at end of this Section.

2.5 LIGHTING RELAYS

- A. Manufacturers: See cut-sheets at end of this Section.

2.6 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."
- B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."
- C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 14 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.
- B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SENSOR INSTALLATION

- A. Comply with NECA 1.
- B. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- C. Install and aim sensors in locations to achieve not less than 90-percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.3 WIRING INSTALLATION

- A. Comply with NECA 1.
- B. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- C. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.4 IDENTIFICATION

- A. Identify components and power and control wiring according to Section 26 05 53 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Lighting control devices will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.7 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

3.8 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION 26 09 23

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Distribution panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of panelboard.
 - 1. Include materials, switching and overcurrent protective devices, accessories, and components indicated.
 - 2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details.
 - 2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
 - 3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
 - 4. Detail bus configuration, current, and voltage ratings.
 - 5. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 6. Include evidence of NRTL listing for series rating of installed devices.
 - 7. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - 8. Include wiring diagrams for power, signal, and control wiring.
 - 9. Key interlock scheme drawing and sequence of operations.
 - 10. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graph paper; include selectable ranges for each type of overcurrent protective device. Include an Internet link for electronic access to downloadable PDF of the coordination curves.

1.4 INFORMATIONAL SUBMITTALS

- A. Test Reports.
- B. Schedules: Submit final versions with O&M.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: ISO 9001 or 9002 certified.

1.7 FIELD CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 - 2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding 104 deg F.
 - b. Altitude: Not exceeding 6600 feet.

1.8 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.
 - 1. Panelboard Warranty Period: 18 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS COMMON REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.

D. Enclosures: Dead-front cabinets.

1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Outdoor Locations: NEMA 250, Type 3R.
 - c. Kitchen and Wash-Down Areas: NEMA 250, Type 4X, stainless steel.
 - d. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
 - e. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.
2. Height: 84 inches maximum.
3. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.
4. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.
5. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
6. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
7. Finishes:
 - a. Panels and Trim: Galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Galvanized steel.
 - c. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components.

E. Phase, Neutral, and Ground Buses:

1. Material: Tin-plated aluminum.
 - a. Plating shall run entire length of bus.
 - b. Bus shall be fully rated the entire length.
2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
4. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.
5. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and listed and labeled by an NRTL acceptable to authority having jurisdiction, as suitable for nonlinear loads in electronic-grade panelboards and others designated on Drawings. Connectors shall be sized for double-sized or parallel conductors as indicated on Drawings. Do not mount neutral bus in gutter.

F. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Tin-plated aluminum.
 2. Terminations shall allow use of 75 deg C rated conductors without derating.
 3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
 4. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.
 5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.
 6. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
 7. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
 8. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.
- G. NRTL Label: Panelboards or load centers shall be labeled by an NRTL acceptable to authority having jurisdiction for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards or load centers shall have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.
- H. Future Devices: Panelboards or load centers shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- I. Panelboard Short-Circuit Current Rating: Rated for series-connected system with integral or remote upstream overcurrent protective devices and labeled by an NRTL. Include label or manual with size and type of allowable upstream and branch devices listed and labeled by an NRTL for series-connected short-circuit rating.
1. Panelboards rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
 2. Panelboards rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.
- J. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.
1. Panelboards and overcurrent protective devices rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
 2. Panelboards and overcurrent protective devices rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

2.2 DISTRIBUTION PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. SIEMENS Industry, Inc.; Energy Management Division.

- 2. Square D; by Schneider Electric.
- B. Panelboards: NEMA PB 1, distribution type.
- C. Doors: None
- D. Mains: As specified.
- E. Branch Overcurrent Protective Devices: Bolt-on circuit breakers

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. SIEMENS Industry, Inc.; Energy Management Division.
 - 2. Square D; by Schneider Electric.
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- D. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. MCCB: Comply with UL 489, with fully rated interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers:
 - a. Inverse time-current element for low-level overloads.
 - b. Instantaneous magnetic trip element for short circuits.
 - c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - 2. Electronic Trip Circuit Breakers (600A and larger):
 - a. RMS sensing.
 - b. Field-replaceable rating plug or electronic trip.
 - c. Digital display of settings, trip targets, and indicated metering displays.
 - d. Ten-event, trip-history log. Each trip event shall be recorded with type, phase, and magnitude of fault that caused the trip.
 - e. Field-Adjustable Settings.
 - 3. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).
 - 4. GFEP Circuit Breakers: Class B ground-fault protection (30-mA trip).
 - 5. Arc-Fault Circuit Interrupter Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.

6. MCCB Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Breaker handle indicates tripped status.
 - c. UL listed for reverse connection without restrictive line or load ratings.
 - d. Lugs: Suitable for number, size, trip ratings, and conductor materials.
 - e. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and HID lighting circuits.
 - f. Shunt Trip (when indicated): 120-V trip coil energized from separate circuit.

2.5 IDENTIFICATION

- A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.
- B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.
- C. Circuit Directory: Computer-generated circuit directory mounted inside panelboard door with transparent plastic protective cover.
 1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.
- B. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.
- C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance

requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

- B. Comply with NECA 1.
- C. Mount panelboard cabinet plumb and rigid without distortion of box.
- D. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- E. Mount surface-mounted panelboards to steel slotted supports 5/8 inch in depth. Orient steel slotted supports vertically.

3.3 IDENTIFICATION

- A. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."
- B. Device Nameplates: Label each branch circuit device in power panelboards with a nameplate complying with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."
- C. Install warning and arc-flash signs complying with requirements in Section 26 05 53 "Identification for Electrical Systems".

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection stated in NETA ATS. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Panelboards will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results, with comparisons of the two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.
- B. Set field-adjustable circuit-breaker trip ranges.
- C. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes. Prior to making circuit changes to achieve load balancing, inform Architect of effect on phase color coding.
 - 1. Measure loads during period of normal facility operations.
 - 2. Perform circuit changes to achieve load balancing outside normal facility operation schedule or at times directed by the Architect. Avoid disrupting services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
 - 3. After changing circuits to achieve load balancing, recheck loads during normal facility operations. Record load readings before and after changing circuits to achieve load balancing.
 - 4. Tolerance: Maximum difference between phase loads, within a panelboard, shall not exceed 20 percent.

END OF SECTION 26 24 16

SECTION 26 41 13 - LIGHTNING PROTECTION FOR STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes lightning protection system for ordinary structures.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Include layouts of the lightning protection system, with details of the components to be used in the installation.
 - 2. Include raceway locations needed for the installation of conductors.
 - 3. Details of air terminals, ground rods, ground rings, conductor supports, splices, and terminations, including concealment requirements.
 - 4. Include roof attachment details, coordinated with roof installation.
 - 5. Calculations required by NFPA 780 for bonding of metal bodies.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of roof adhesive for attaching the roof-mounted air terminal assemblies, approved by the roofing-material manufacturer.
- C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For lightning protection system to include in maintenance manuals.
 - 1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:

- a. Dimensioned site plan showing dimensioned route of the ground loop conductor and the ground rod locations. Comply with requirements of Section 01 78 39 "Project Record Documents."
- b. A system testing and inspection record, listing the results of inspections and ground resistance tests, as recommended by NFPA 780, Annex D.

B. Completion Certificate: UL Master Label Certificate.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: UL-listed installer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1. Advanced Lightning Technology, Ltd.
- 2. East Coast Lightning Equipment Inc.
- 3. ERICO International Corporation.
- 4. Harger Lightning & Grounding.
- 5. Heary Bros. Lightning Protection Co. Inc.
- 6. Independent Protection Co.
- 7. National Lightning Protection.
- 8. Preferred Lightning Protection.
- 9. Robbins Lightning, Inc.
- 10. Thompson Lightning Protection, Inc.

2.2 PERFORMANCE REQUIREMENTS

- A. UL Lightning Protection Standard: Comply with UL 96A requirements for Class I buildings.
- B. Lightning Protection Components, Devices, and Accessories: Listed and labeled by a qualified testing agency as complying with UL 96, and marked for intended location and application.

2.3 MATERIALS

A. Air Terminals:

- 1. Copper unless otherwise indicated.
- 2. 3/8-inch diameter by 18 inches long.
- 3. Rounded tip.

B. Class 1 Main Conductors:

1. Copper: 57,400 circular mils in diameter.
- C. Secondary Conductors:
 1. Stranded Copper: 26,240 circular mils in diameter.
- D. Ground Loop Conductor: Stranded copper.
- E. Ground Rods:
 1. Material: Copper-clad steel.
 2. Diameter: 5/8 inch.
 3. Rods shall be not less than 120 inches long.
 4. Sectional type, with integral threads.
- F. Conductor Splices and Connectors: Compression fittings that are installed with hydraulically operated tools, or exothermic welds, approved for use with the class type.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install lightning protection components and systems according to UL 96A.
- B. Install conductors with direct paths from air terminals to ground connections. Avoid bends less than 90 degrees and 8 inches in radius and narrow loops.
- C. Conceal conductors within normal view from exterior locations at grade within 200 feet of building. Comply with requirements for concealed installations in UL 96A.
 1. Roof penetrations required for down conductors and connections to structural-steel framework shall be made using listed through-roof fitting and connector assemblies with solid rods and appropriate roof flashings. Use materials approved by the roofing manufacturer for the purpose. Conform to the methods and materials required at roofing penetrations of the lightning protection components to ensure compatibility with the roofing specifications and warranty.
 2. Install conduit where necessary to comply with conductor concealment requirements.
 3. Air Terminals on Single-Ply Membrane Roofing: Comply with adhesive manufacturer's written instructions.
- D. Ground Ring Electrode: The conductor shall be not less than the main-size lightning conductor.

3.2 CONNECTIONS

- A. Aboveground concealed connections, and connections in earth or concrete, shall be done by exothermic welds or by high-compression fittings listed for the purpose.

- B. Aboveground exposed connections shall be done using the following types of connectors, listed and labeled for the purpose: exothermic weld, high compression or crimp.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

3.3 CORROSION PROTECTION

- A. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials.
- B. Use conductors with protective coatings where conditions would cause deterioration or corrosion of conductors.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
 - 1. Perform inspections as required to obtain a UL Master Label for system.
- B. Prepare test and inspection reports and certificates.

END OF SECTION 26 41 13

SECTION 26 51 19 - LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Manuals.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.6 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: Five year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- B. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

- 1. Label shall include the following lamp characteristics:

- a. "USE ONLY" and include specific lamp type.
 - b. Lamp diameter, shape, size, wattage, and coating.
 - c. CCT and CRI.

- C. Recessed luminaires shall comply with NEMA LE 4.

2.2 FIXTURE SCHEDULE

- A. Manufacturers: See schedule on drawings and product cut-sheets at the end of this Section.

2.3 MATERIALS

- A. Metal Parts:

- 1. Free of burrs and sharp corners and edges.
 - 2. Sheet metal components shall be steel unless otherwise indicated.
 - 3. Form and support to prevent warping and sagging.

- B. Steel:

- 1. ASTM A 36/A 36M for carbon structural steel.
 - 2. ASTM A 568/A 568M for sheet steel.

- C. Stainless Steel:

- 1. 1. Manufacturer's standard grade.
 - 2. 2. Manufacturer's standard type, ASTM A 240/240 M.

- D. Galvanized Steel: ASTM A 653/A 653M.

- E. Aluminum: ASTM B 209.

2.4 METAL FINISHES

- A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.5 LUMINAIRE SUPPORT

- A. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.
- C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage.
- D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

- A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is sufficiently complete, clean luminaires used for temporary lighting and install new lamps.

3.3 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire.
- D. Supports:
 - 1. Sized and rated for luminaire weight.
 - 2. Able to maintain luminaire position after cleaning and relamping.
 - 3. Provide support for luminaire without causing deflection of ceiling or wall.

4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

E. Flush-Mounted Luminaires:

1. Secured to outlet box.
2. Attached to ceiling structural members at four points equally spaced around circumference of luminaire.
3. Trim ring flush with finished surface.

F. Wall-Mounted Luminaires:

1. Attached to structural members in walls
2. Do not attach luminaires directly to gypsum board.

G. Suspended Luminaires:

1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
3. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.

H. Ceiling-Grid-Mounted Luminaires:

1. Secure to any required outlet box.
2. Secure luminaire to the luminaire opening using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
3. Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.

- I. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.
- B. Luminaire will be considered defective if it does not pass operation tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 26 51 19

SECTION 28 05 13 - CONDUCTORS AND CABLES FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fire alarm wire and cable.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 FIRE ALARM WIRE AND CABLE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Allied Wire & Cable Inc.
 - 2. CommScope, Inc.
 - 3. Comtran Corporation.
 - 4. Draka Cableteq USA; a Prysmian Group company.
 - 5. Genesis Cable Products; Honeywell International, Inc.
 - 6. Radix Wire.
 - 7. Rockbestos-Suprenant Cable Corp.
 - 8. Superior Essex Inc.
 - 9. West Penn Wire.
- B. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.
- C. Signaling Line Circuits: Twisted, shielded pair, not less than No. 16 AWG.
- D. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation, and complying with requirements in UL 2196 for a two-hour rating.

1. Low-Voltage Circuits: No. 16 AWG, minimum, in pathway.
2. Line-Voltage Circuits: No. 12 AWG, minimum, in pathway.

PART 3 - EXECUTION

3.1 WIRING METHOD

- A. Install all wiring in conduit.
 1. Minimum conduit size shall be 3/4 inch.

3.2 FIRE ALARM WIRING INSTALLATION

- A. Comply with NECA 1 and NFPA 72.

3.3 POWER AND CONTROL-CIRCUIT CONDUCTORS

- A. 120-V Power Wiring: Install according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables" unless otherwise indicated.
- B. Minimum Conductor Sizes:
 1. Class 1 remote-control and signal circuits, No. 14 AWG.
 2. Class 2 low-energy, remote-control and signal circuits, No. 16 AWG.
 3. Class 3 low-energy, remote-control, alarm and signal circuits, No. 12 AWG.

3.4 CONNECTIONS

- A. Comply with requirements in Section 28 31 11 "Digital, Addressable Fire-Alarm System" for connecting, terminating, and identifying wires and cables.

3.5 FIRESTOPPING

- A. Comply with requirements in Section 07 84 13 "Penetration Firestopping."

END OF SECTION 28 05 13

SECTION 28 46 21 - ADDRESSABLE FIRE-ALARM SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Fire-alarm control unit.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Heat detectors.
5. Notification appliances.
6. Device guards.
7. Firefighters' two-way telephone communication service.
8. Magnetic door holders.
9. Remote annunciator.
10. Addressable interface device.
11. Digital alarm communicator transmitter.
12. Network communications.

- B. Related Requirements:

1. Section 280513 "Conductors and Cables for Electronics Safety and Security" for cables and conductors for fire-alarm systems.

1.3 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. FACP: Fire Alarm Control Panel.
- C. HLI: High Level Interface.
- D. NICET: National Institute for Certification in Engineering Technologies.
- E. PC: Personal computer.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.

1. Include construction details, material descriptions, dimensions, profiles, and finishes.
2. Include rated capacities, operating characteristics, and electrical characteristics.

B. Shop Drawings: For fire-alarm system.

1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
2. Include plans, elevations, sections, details, and attachments to other work.
3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
4. Detail assembly and support requirements.
5. Include voltage drop calculations for notification-appliance circuits.
6. Include battery-size calculations.
7. Include input/output matrix.
8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
9. Include performance parameters and installation details for each detector.
10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
11. Provide program report showing that air-sampling detector pipe layout balances pneumatically within the airflow range of the air-sampling detector.
12. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.
 - a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
 - b. Show field wiring required for HVAC unit shutdown on alarm.
 - c. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' control system.
 - d. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' smoke-evacuation system.
 - e. Locate detectors according to manufacturer's written recommendations.
 - f. Show air-sampling detector pipe routing.
13. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram.
14. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

C. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. Trained and certified by manufacturer in fire-alarm system design.
 - b. NICET-certified, fire-alarm technician; **Level III** minimum.
 - c. Licensed or certified by authorities having jurisdiction.

- D. Delegated-Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.
 - 2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
 - 3. Indicate audible appliances required to produce square wave signal per NFPA 72.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.

1.6 Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
 - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following **and deliver copies to authorities having jurisdiction**:
 - a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
 - d. Riser diagram.
 - e. Device addresses.
 - f. Record copy of site-specific software.
 - g. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
 - 1) Equipment tested.
 - 2) Frequency of testing of installed components.
 - 3) Frequency of inspection of installed components.
 - 4) Requirements and recommendations related to results of maintenance.
 - 5) Manufacturer's user training manuals.

- h. Manufacturer's required maintenance related to system warranty requirements.
- i. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:

- 1. Software operating and upgrade manuals.
- 2. Program Software Backup: On magnetic media or compact disk, complete with data files.
- 3. Device address list.
- 4. Printout of software application and graphic screens.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

- 1. Lamps for Remote Indicating Lamp Units: Quantity equal to **10** percent of amount installed, but no fewer than one unit.
- 2. Lamps for Strobe Units: Quantity equal to **10** percent of amount installed, but no fewer than one unit.
- 3. Smoke Detectors, Fire Detectors: Quantity equal to **10** percent of amount of each type installed, but no fewer than one unit of each type.
- 4. Detector Bases: Quantity equal to **two** percent of amount of each type installed, but no fewer than one unit of each type.
- 5. Keys and Tools: One extra set for access to locked or tamperproofed components.
- 6. Audible and Visual Notification Appliances: **Two** of each type installed.
- 7. Fuses: **Two** of each type installed in the system. Provide in a box or cabinet with compartments marked with fuse types and sizes.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
- B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm **Level III** technician.
- C. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
 - 2. Warranty Period: **Five** years from date of manufacture.

- B. Warranties specified in Division 01 Specification Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.
- B. Noncoded, UL-certified addressable system, with multiplexed signal transmission and **horn**/strobe evacuation.
- C. Automatic sensitivity control of certain smoke detectors.
- D. All components provided shall be listed for use with the selected system.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices **and systems**:
 - 1. Manual stations.
 - 2. Heat detectors.
 - 3. Smoke detectors.
 - 4. Duct smoke detectors.
 - 5. Carbon monoxide detectors.
 - 6. Automatic sprinkler system water flow.
 - 7. Fire-extinguishing system operation.
 - 8. Dry system pressure flow switch.
- B. Fire-alarm signal shall initiate the following actions:
 - 1. Continuously operate alarm notification appliances.
 - 2. Identify alarm and specific initiating device at fire-alarm control unit, **and remote annunciators**.
 - 3. Transmit an alarm signal to the remote alarm receiving station.
 - 4. Unlock electric door locks in designated egress paths.
 - 5. Release fire and smoke doors held open by magnetic door holders.
 - 6. Activate voice/alarm communication system.
 - 7. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
 - 8. Activate stairwell and elevator-shaft pressurization systems.
 - 9. Recall elevators to primary or alternate recall floors.

10. Activate elevator power shunt trip.
11. Activate emergency lighting control.
12. Activate emergency shutoffs for gas and fuel supplies.
13. Record events in the system memory.
14. Indicate device in alarm on the graphic annunciator.

C. Supervisory signal initiation shall be by one or more of the following devices and actions:

1. Valve supervisory switch.
2. Elevator shunt-trip supervision.
3. Independent fire-detection and -suppression systems.
4. User disabling of zones or individual devices.

D. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.
2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3. Loss of communication with any addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
4. Loss of primary power at fire-alarm control unit.
5. Ground or a single break in internal circuits of fire-alarm control unit.
6. Abnormal ac voltage at fire-alarm control unit.
7. Break in standby battery circuitry.
8. Failure of battery charging.
9. Abnormal position of any switch at fire-alarm control unit or annunciator.
10. Voice signal amplifier failure.
11. Hose cabinet door open.

E. System Supervisory Signal Actions:

1. Initiate notification appliances.
2. Identify specific device initiating the event at fire-alarm control unit **and remote annunciators.**
3. Transmit system status to building management system.
4. Display system status on graphic annunciator.

2.3 FIRE-ALARM CONTROL UNIT

A. Basis-of-Design Product: Subject to compliance with requirements, provide Potter Electric Signal Company, LLC; IPA Series control panel or a comparable product by one of the following:

1. Fire-Lite Alarms, Inc; A Honeywell International Company.
2. Silent Knight.
3. Bosch Security Systems, Inc.
4. Potter Electric Signal Company, LLC

B. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
 - a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
 - b. Include a real-time clock for time annotation of events on the event recorder and printer.
 - c. Provide communication between the FACP and remote circuit interface panels, annunciators, and displays.
 - d. The FACP shall be listed for connection to a central-station signaling system service.
 - e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 4000-event history log.
 2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
 3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.
- C. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and control menu.
1. Annunciator and Display: Liquid-crystal type, **160** characters, minimum.
 2. Keypad: Arranged to permit entry and execution of display, and control commands.
- D. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
1. Annunciator and Display: Liquid-crystal type, **four** lines of **40** characters, minimum.
 2. Keypad: Arranged to permit entry and execution of display, and control commands.
- E. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:
1. Pathway Class Designations: NFPA 72, **Class A**.
 2. Pathway Survivability: **Level 0**.
 3. Serial Interfaces:
 - a. One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
 - b. One Ethernet port for PC configuration.
- F. Smoke-Alarm Verification:
1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.

2. Activate an approved "alarm-verification" sequence at fire-alarm control unit and detector.
3. Record events by the system printer.
4. Sound general alarm if the alarm is verified.
5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

G. Notification-Appliance Circuit:

1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
2. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.
3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.

H. Elevator Recall:

1. Elevator recall shall be initiated only by one of the following alarm-initiating devices:
 - a. Elevator lobby detectors except the lobby detector on the designated floor.
 - b. Smoke detector in elevator machine room.
 - c. Smoke detectors in elevator hoistway.
2. Elevator controller shall be programmed to move the cars to the alternate recall floor if lobby detectors located on the designated recall floors are activated.
3. Water-flow alarm connected to sprinkler in an elevator shaft and elevator machine room shall shut down elevators associated with the location without time delay.
 - a. Water-flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.

I. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke-barrier walls shall **be** connected to fire-alarm system.

J. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory.

K. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.

L. Voice/Alarm Signaling Service: Central emergency communication system

1. Indicate number of alarm channels for automatic, simultaneous transmission of different announcements to different zones or for manual transmission of announcements by use of the central-control microphone. Amplifiers shall comply with UL 1711.

- a. Allow the application of, and evacuation signal to, indicated number of zones and, at the same time, allow voice paging to the other zones selectively or in any combination.
 - b. Programmable tone and message sequence selection.
 - c. Standard digitally recorded messages for "Evacuation" and "All Clear."
 - d. Generate tones to be sequenced with audio messages of type recommended by NFPA 72 and that are compatible with tone patterns of notification-appliance circuits of fire-alarm control unit.
2. Status Annunciator: Indicate the status of various voice/alarm speaker zones and the status of firefighters' two-way telephone communication zones.
- M. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, **supervisory and digital alarm communicator transmitters** shall be powered by 24-V dc source.
 1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
- N. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
 1. Batteries: **Sealed lead calcium.**
- O. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.4 MANUAL FIRE-ALARM BOXES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Potter Electric Signal Company, LLC manual fire-alarm boxes or comparable products by one of the following:
 1. Fire-Lite Alarms, Inc; A Honeywell International Company.
 2. Silent Knight.
 3. Bosch Security Systems, Inc.
 4. Potter Electric Signal Company, LLC.
- B. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be die-cast construction finished in red with operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.
 1. Double-action mechanism requiring two actions to initiate an alarm, **lift-cover, pull-lever** type; with **integral** addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
 2. Station Reset: Key- or wrench-operated switch.

3. Indoor Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.
4. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.

2.5 SYSTEM SMOKE DETECTORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Potter Electric Signal Company, LLC system smoke detectors or comparable products by one of the following:

1. Fire-Lite Alarms, Inc; A Honeywell International Company.
2. Silent Knight.
3. Bosch Security Systems, Inc.
4. Potter Electric Signal Company, LLC.

- B. General Requirements for System Smoke Detectors:

1. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
2. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
3. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
4. Integral Visual-Indicating Light: LED type, indicating detector has operated.
5. Remote Control: Unless otherwise indicated, detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition.
 - a. Rate-of-rise temperature characteristic of combination smoke- and heat-detection units shall be selectable at fire-alarm control unit for 15 deg F (8 deg C) per minute.
 - b. Fixed-temperature sensing characteristic of combination smoke- and heat-detection units shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 deg F (57 deg C).
 - c. Multiple levels of detection sensitivity for each sensor.
 - d. Sensitivity levels based on time of day.

- C. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).

D. Duct Smoke Detectors: Photoelectric type complying with UL 268A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
3. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
4. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.6 CARBON MONOXIDE DETECTORS

A. General: Carbon monoxide detector listed for connection to fire-alarm system.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system.
2. Twist-lock base interchangeable with smoke-detector bases.
3. Testable by introducing test carbon monoxide into the sensing cell.
4. Detector shall send trouble alarm when nearing end-of-life, or internal faults.
5. Comply with UL 2075.
6. Minimum 8-year sensor lifespan.
7. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Sensor run-time and life remaining.

2.7 HEAT DETECTORS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Potter Electric Signal Company, LLC heat detectors or comparable products by one of the following:

1. Fire-Lite Alarms, Inc; A Honeywell International Company.
2. Silent Knight.
3. Bosch Security Systems, Inc.
4. Potter Electric Signal Company, LLC.

B. General Requirements for Heat Detectors: Comply with UL 521.

1. Temperature sensors shall test for and communicate the sensitivity range of the device.
- C. Heat Detector, Combination Type: Actuated by either a fixed temperature of **135 deg F (57 deg C)** or a rate of rise that exceeds **15 deg F (8 deg C)** per minute unless otherwise indicated.
 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
- D. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of **185 deg F (85 deg C)**.
 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
- E. Continuous Linear Heat-Detector System:
 1. Detector Cable: Rated detection temperature **155 deg F (68 deg C)**. Listed for "regular" service and a standard environment. Cable includes two steel actuator wires twisted together with spring pressure, wrapped with protective tape, and finished with PVC outer sheath. Each actuator wire is insulated with heat-sensitive material that reacts with heat to allow the cable twist pressure to short circuit wires at the location of elevated temperature.
 2. Control Unit: Two-zone or multizone unit as indicated. Provide same system power supply, supervision, and alarm features as specified for fire-alarm control unit.
 3. Signals to Fire-Alarm Control Unit: Any type of local system trouble shall be reported to fire-alarm control unit as a composite "trouble" signal. Alarms on each detection zone shall be individually reported to central fire-alarm control unit as separately identified zones.
 4. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.8 NOTIFICATION APPLIANCES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Potter Electric Signal Company, LLC notification appliances or comparable products by one of the following:
 1. Fire-Lite Alarms, Inc; A Honeywell International Company.
 2. Silent Knight.
 3. Bosch Security Systems, Inc.
 4. Potter Electric Signal Company, LLC
- B. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.

- C. Chimes, Low-Level Output: 70-dBA minimum rated output.
- D. Chimes, High-Level Output: 66-dBA minimum rated output.
- E. Horns: Electronic-polarized type, 24-V dc. Comply with UL 464. Horns shall produce a sound-pressure level of 75 dBA, measured **10 feet (3 m)** from the horn, using the coded signal prescribed in UL 464 test protocol.
- F. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear lens mounted on an aluminum faceplate. The word "FIRE" is displayed in minimum **1-inch- (25-mm-)** high letters.
 - 1. Rated Light Output:
 - a. 15/30/75/110 cd, selectable in the field.
 - 2. Mounting: Wall mounted unless otherwise indicated.
 - 3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
 - 4. Flashing shall be in a temporal pattern, synchronized with other units.
 - 5. Strobe Leads: Factory connected to screw terminals.
 - 6. Mounting Faceplate: Factory finished, **red**.
- G. Voice/Tone Notification Appliances:
 - 1. Comply with UL 1480.
 - 2. Speakers for Voice Notification: Locate speakers for voice notification to provide the intelligibility requirements of the "Notification Appliances" and "Emergency Communications Systems" chapters in NFPA 72.
 - 3. High-Range Units: Rated 2 to 15 W.
 - 4. Low-Range Units: Rated 1 to 2 W.
 - 5. Mounting: **surface mounted and bidirectional**.
 - 6. Matching Transformers: Tap range matched to acoustical environment of speaker location.
- H. Exit Marking Audible Notification Appliance:
 - 1. Exit marking audible notification appliances shall meet the audibility requirements in NFPA 72.
 - 2. Provide exit marking audible notification appliances at the entrance to all building exits.
 - 3. Provide exit marking audible notification appliances at the entrance to areas of refuge with audible signals distinct from those used for building exit marking.

2.9 FIREFIGHTERS' TWO-WAY TELEPHONE COMMUNICATION SERVICE

- A. Dedicated, two-way, supervised, telephone voice communication links between fire-alarm control unit and remote firefighters' telephone stations. Supervised telephone lines shall be connected to talk circuits by controls in a control module. Provide the following:
 - 1. Common-talk type for firefighter use only.
 - 2. Selective-talk type for use by firefighters and fire wardens.

3. Audible Pulse and Tone Generator, and High-Intensity Lamp: When a remote telephone is taken off the hook, it causes an audible signal to sound and a high-intensity lamp to flash at the fire command center.
4. Selector panel controls to provide for simultaneous operation of up to five telephones in the same zone. Indicate ground faults and open or shorted telephone lines on the panel front by individual LEDs.
5. Display: LED to indicate location of caller.
6. Remote Telephone Cabinet: Flush- or surface-mounted cabinet as indicated, factory-standard red finish, with handset.
7. Remote Telephone Jack Stations: Single-gang, stainless-steel-plate mounted plug, engraved "Fire Emergency Phone."

2.10 MAGNETIC DOOR HOLDERS

- A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.
 1. Electromagnets: Require no more than 3 W to develop **25-lbf (111-N)** holding force.
 2. Wall-Mounted Units: Flush mounted unless otherwise indicated.
 3. Rating: 24-V ac or dc.
 4. Rating: 120-V ac.
- B. Material and Finish: Match door hardware.

2.11 REMOTE ANNUNCIATOR

- A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.
 1. Mounting: **Flush** cabinet, NEMA 250, Type 1.
- B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

2.12 ADDRESSABLE INTERFACE DEVICE

- A. General:
 1. Include address-setting means on the module.
 2. Store an internal identifying code for control panel use to identify the module type.
- B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.
- C. Integral Relay: Capable of providing a direct signal **to elevator controller to initiate elevator recall.**

1. Allow the control panel to switch the relay contacts on command.
2. Have a minimum of one normally open and one normally closed contacts available for field wiring.

D. Control Module:

1. Operate notification devices.
2. Operate solenoids for use in sprinkler service.

2.13 DIGITAL ALARM COMMUNICATOR TRANSMITTER

- A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632.
- B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture **two** telephone line(s) and dial a preset number for a remote central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.
- C. Local functions and display at the digital alarm communicator transmitter shall include the following:
 1. Verification that both telephone lines are available.
 2. Programming device.
 3. LED display.
 4. Manual test report function and manual transmission clear indication.
 5. Communications failure with the central station or fire-alarm control unit.
- D. Digital data transmission shall include the following:
 1. Address of the alarm-initiating device.
 2. Address of the supervisory signal.
 3. Address of the trouble-initiating device.
 4. Loss of ac supply.
 5. Loss of power.
 6. Low battery.
 7. Abnormal test signal.
 8. Communication bus failure.
- E. Secondary Power: Integral rechargeable battery and automatic charger.
- F. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.14 NETWORK COMMUNICATIONS

- A. Provide network communications for fire-alarm system according to fire-alarm manufacturer's written requirements.
- B. Provide network communications pathway per manufacturer's written requirements and requirements in NFPA 72 and NFPA 70.

2.15 DEVICE GUARDS

- A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.
 - 1. Factory fabricated and furnished by device manufacturer.
 - 2. Finish: Paint of color to match the protected device.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
 - 1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.
- B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
 - 1. Devices placed in service before all other trades have completed cleanup shall be replaced.
 - 2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.
- B. Install wall-mounted equipment, with tops of cabinets not more than 78 inches (1980 mm) above the finished floor.

1. Comply with requirements for seismic-restraint devices specified in Section 270548.16 "Seismic Controls for Communications Systems."
- C. Manual Fire-Alarm Boxes:
1. Install manual fire-alarm box in the normal path of egress within **60 inches (1520 mm)** of the exit doorway.
 2. Mount manual fire-alarm box on a background of a contrasting color.
 3. The operable part of manual fire-alarm box shall be between **42 inches (1060 mm)** and **48 inches (1220 mm)** above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- D. Smoke- or Heat-Detector Spacing:
1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
 2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
 3. Smooth ceiling spacing shall not exceed **30 feet (9 m)**.
 4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A [**or Annex B**] in NFPA 72.
 5. HVAC: Locate detectors not closer than **60 inches (1520 mm)** from air-supply diffuser or return-air opening.
 6. Lighting Fixtures: Locate detectors not closer than **12 inches (300 mm)** from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.
- E. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- F. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than **36 inches (9100 mm)** long shall be supported at both ends.
1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.
- G. Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location. Do not install smoke detectors in sprinklered elevator shafts.
- H. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.
- I. Audible Alarm-Indicating Devices: Install not less than **6 inches (150 mm)** below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.
- J. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least **6 inches (150 mm)** below the ceiling. Install all devices at the same height unless otherwise indicated.

- K. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.3 PATHWAYS

- A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.
 - 1. Exposed pathways located less than 96 inches (2440 mm) above the floor shall be installed in EMT.
- B. Pathways shall be installed in EMT.
- C. Exposed EMT shall be painted red enamel.

3.4 CONNECTIONS

- A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 087100 "Door Hardware." Connect hardware and devices to fire-alarm system.
 - 1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.
- B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches (910 mm) from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
 - 1. Alarm-initiating connection to smoke-control system (smoke management) at firefighters' smoke-control system panel.
 - 2. Alarm-initiating connection to stairwell and elevator-shaft pressurization systems.
 - 3. Magnetically held-open doors.
 - 4. Electronically locked doors and access gates.
 - 5. Alarm-initiating connection to elevator recall system and components.
 - 6. Alarm-initiating connection to activate emergency lighting control.
 - 7. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
 - 8. Supervisory connections at valve supervisory switches.
 - 9. Supervisory connections at elevator shunt-trip breaker.
 - 10. Data communication circuits for connection to building management system.

3.5 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.6 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by **authorities having jurisdiction**.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Perform the following tests and inspections **with the assistance of a factory-authorized service representative**:
 - 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
 - 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
 - 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
 - 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
 - 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- F. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.
- H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.
- I. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.7 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include **12** months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 - 1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.8 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for **two** years.
- C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within **two** years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
 - 1. Upgrade Notice: At least **30** days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

3.9 DEMONSTRATION

Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 284621.11

ITB 21-13

Attachment A:

BID SET - Drawings

Renovation and Expansion of the Rec

Consisting of 6 E-Mails Sent to Contractor on 5/6/21 and as referenced in ITB 21-13

PORT ORANGE RECREATION CENTER REMODEL

CITY OF PORT ORANGE - VOLUSIA COUNTY, FL
FINAL ENGINEERING PLANS PLANS

OWNER:

DJ DESIGN, INC.
913 N. NOVA ROAD
HOLLY HILL, FL 32117
PHONE NUMBER
FAX NUMBER
CONTACT PERSON: DANA SMITH, AIA
e-mail: dsmith@djdesigninc.com

CIVIL ENGINEER:

ZEY COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD, SUITE C
ORMOND BEACH, FL 32174
PHONE NUMBER: (386) 677-2482
FAX NUMBER: (386) 677-2505
CONTACT PERSON: KRISTOPHER T. ROWLEY, P.E.
e-mail: krowley@zevcohen.com

SURVEYOR:

MARK DOWST & ASSOCIATES
536 N. HALIFAX AVE.
DAYTONA BEACH, FLORIDA 32119
PHONE NUMBER (386) 258-7999
FAX NUMBER (386) 257-4310
CONTACT PERSON: MARK DOWST, P.E.
e-mail: markdowst@mdaeng.com

LANDSCAPE ARCHITECT:

ZEY COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD, SUITE C
ORMOND BEACH, FL 32174
PHONE NUMBER: (386) 677-2482
FAX NUMBER: (386) 677-2505
CONTACT PERSON: JAKE STEHR, RLA
e-mail: jstehr@zevcohen.com

PROJECT DESCRIPTION:

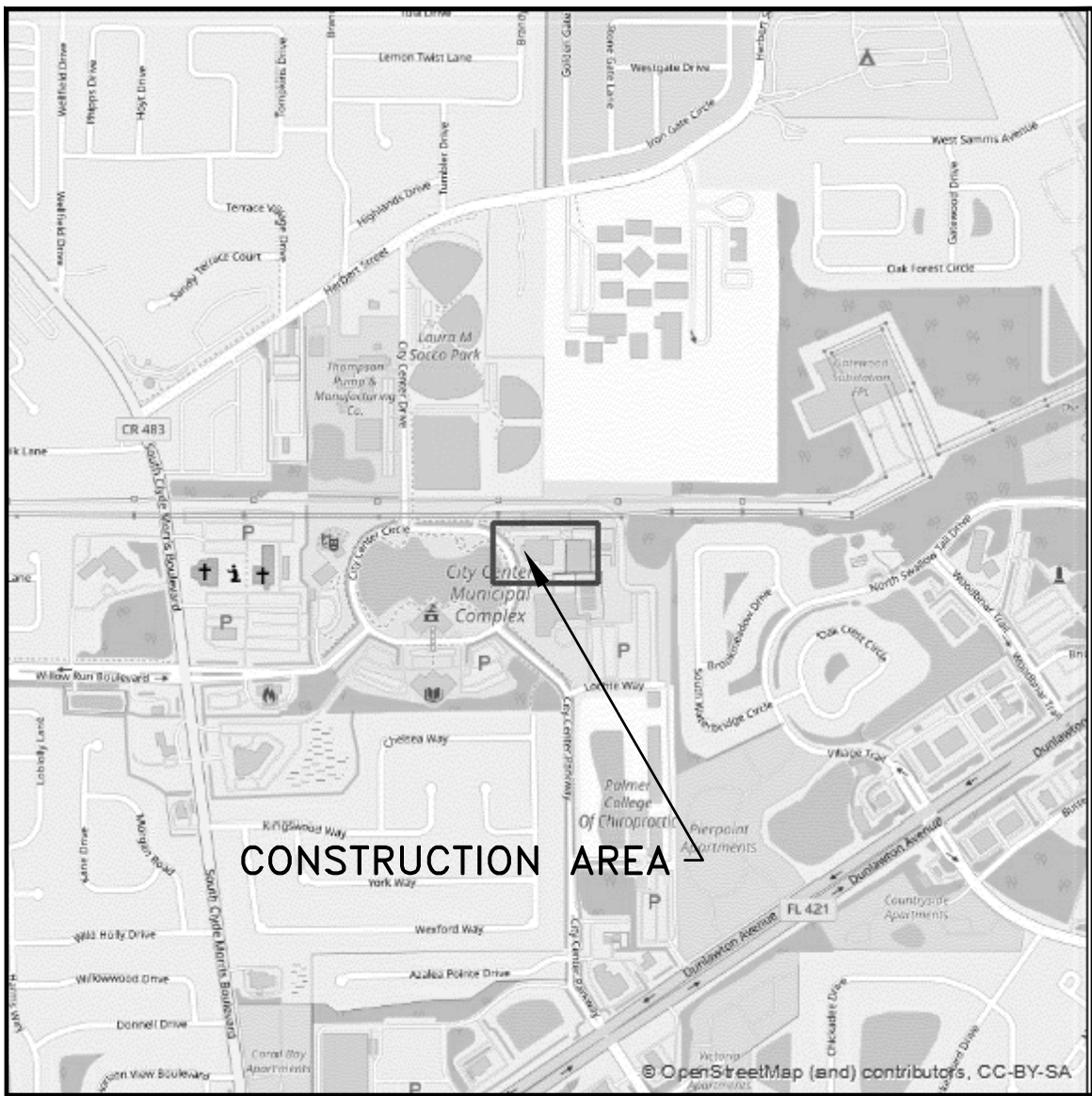
THIS PROJECT INCLUDES THE PROPOSED ADDITIONS AND ASSOCIATED SITE IMPROVEMENTS TO THE EXISTING FACILITY AT THIS LOCATION.

SITE INFORMATION:

SITE ADDRESS:	4655 CITY CENTER CIRCLE, PORT ORANGE, FL. 32129
PROJECT AREA:	1.007 AC
TAX PARCEL I.D. #:	08-16-33-06-00-0020
EXISTING ZONING:	GOVERNMENT/PUBLIC USE
PROPOSED ZONING:	GOVERNMENT/PUBLIC USE
EXISTING LAND USE:	GOVERNMENT/PUBLIC USE
PROPOSED LAND USE:	GOVERNMENT/PUBLIC USE
EXISTING FUTURE LAND USE:	GOVERNMENT/PUBLIC USE
UNIT/LOT COUNT:	N.A.
UNIT/LOT DENSITY:	N.A. PER ACRE
SETBACKS:	
FRONT:	## FT
SIDE:	## FT
REAR:	## FT
PERIMETER:	## FT

LAND USE TABLE:		
	ACREAGE	PERCENTAGE
EXISTING CONDITIONS:		
WETLAND AREA	0 AC	0%
UPLAND AREA	1.007 AC	100%
PROPOSED IMPROVEMENTS:		
BUILDING(S)	# AC	##%
PAVEMENT & SIDEWALK	# AC	##%
POND AREA(S)	# AC	##%
LANDSCAPE/OPEN SPACE	# AC	##%
TOTAL PERVIOUS		
	# AC	##%
TOTAL IMPERVIOUS		
	# AC	##%

PARKING CALCULATIONS:			
USE	PARKING REQUIREMENT	SF/UNITS	SPACES REQUIRED
TYPE OF USE	# SPACE PER # SF	##	##
TYPE OF USE	# SPACE PER UNIT	##	##
TYPE OF USE	# SPACE PER UNIT	##	##
		TOTAL =	##
PARKING SPACES PROVIDED:			##
HANDICAP PARKING REQUIRED:			##
HANDICAP PARKING PROVIDED:			##

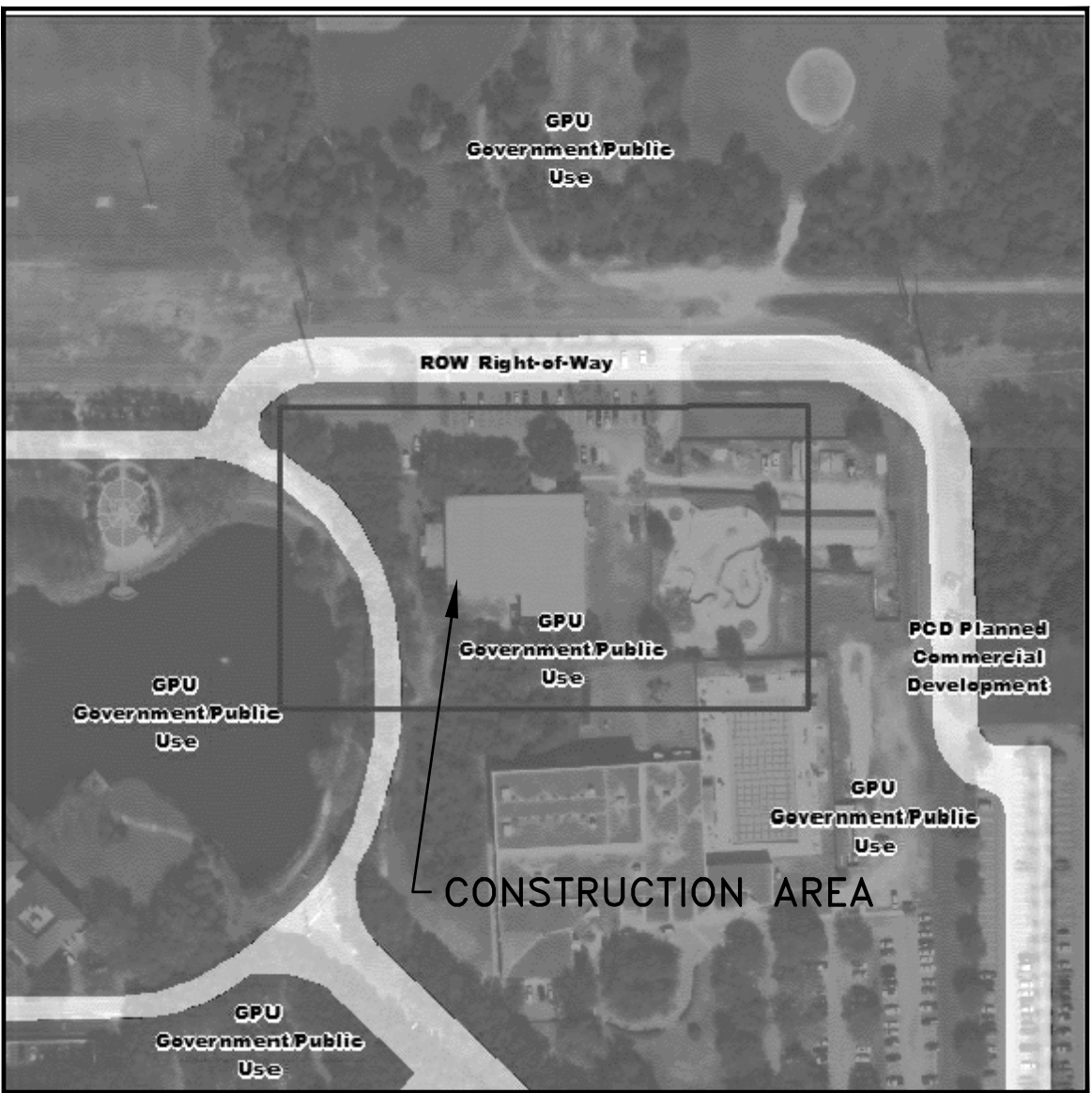


VICINITY MAP
SCALE: 1" = 1000'



SOILS MAP
SCALE: 1" = 200'

THE SITE LIES WITHIN THE FOLLOWING VOLUSIA COUNTY SOIL CLASSIFICATIONS:
0-WATER; 13-CASSIA FINE SAND; 17-DAYTONA SAND, 0 TO 5PERCENT SLOPES; 32-YYAKKA FINE SAND; 42-PAOLA FINE SAND, 0 TO 6 PERCENT SLOPES



ZONING MAP
SCALE: 1" = 200'
CURRENT ZONING FOR THIS SITE IS: CPU



FLOOD ZONE MAP
SCALE: 1" = 200'

THE PROPERTY LIES IN:
FLOOD ZONE X PER FEMA MAPS 12127C0369J EFF. 9/29/2017

SHEET INDEX:

- C1 COVER SHEET
- C2-C3 CONSTRUCTION NOTES
- C4 DEMOLITION & EROSION CONTROL PLAN
- C5 PAVING, GRADING & DRAINAGE PLAN
- C6 UTILITY PLAN
- C7 CONSTRUCTION DETAILS
- LA1 LANDSCAPE PLAN & DETAILS



CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL
PLANNING
TRANSPORTATION

NO.	DATE	BY	REVISIONS
1	08-05-20	JD	80% DESIGN PLANS
2	08-05-20	JD	80% DESIGN PLANS

PORT ORANGE RECREATION
CENTER REMODEL
FINAL ENGINEERING PLANS
COVER SHEET

PROJECT NO.: ZC 20005
DESIGNED BY: JD
DRAFTED BY: TR
CHECKED BY: JD
DRAWING FILE: 01-20005_COV
XREFS: -
XREFS: -

JOHN A. DILLARD, JR., P.E. NO. 37256
NOT VALID WITHOUT SEAL
SHEET: C1 OF 7

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF PORT ORANGE LAND DEVELOPMENT CODE REQUIREMENTS, STANDARD CONSTRUCTION DETAILS & STANDARD SPECIFICATIONS, LATEST EDITIONS.
2. ALL DRAINAGE STRUCTURES AND OTHER IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE MOST RECENT EDITION OF FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION.
3. SHOP DRAWINGS AND CERTIFICATIONS FOR ALL MATERIALS AND STRUCTURES ARE REQUIRED. THE CONTRACTOR SHALL REVIEW AND SIGN SHOP DRAWINGS. THE CONTRACTOR SHALL SUBMIT REVIEWED SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING THE MATERIALS REQUIRED FOR CONSTRUCTION.
4. CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL REQUIRED PERMITS. THE CONTRACTOR SHALL MAINTAIN COPIES OF ALL RELEVANT PERMITS AND CONSTRUCTION DOCUMENTS AVAILABLE ON THE JOB SITE AT ALL TIMES.
5. CONTRACTOR TO MAINTAIN THE SITE IN A SAFE AND SECURE MANNER TO PROTECT PUBLIC SAFETY AND THE CONDITIONS OF THE IMPROVEMENTS.
6. THE CONTRACTOR SHALL MAINTAIN, AT THE JOB SITE, A RECORD COPY OF ALL CONSTRUCTION DRAWINGS AND SPECIFICATIONS ON WHICH ALL FIELD CHANGES ARE TO BE SHOWN. THESE CHANGES ARE TO BE INCORPORATED IN THE "AS-BUILT" SURVEY FURNISHED TO THE ENGINEER.
7. SHOULD CONDITIONS VARY FROM THOSE SHOWN ON THESE PLANS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF RECORD PRIOR TO CONTINUING CONSTRUCTION.
8. ANY FIELD MODIFICATIONS OR DEVIATIONS TO THESE CONSTRUCTION PLANS REQUIRES APPROVAL BY BOTH THE ENGINEER OF RECORD AND THE CITY PRIOR TO PERFORMING THE WORK.
9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE AN "AS-BUILT" SURVEY OF THE COMPLETED CONSTRUCTION. THE "AS-BUILT" SURVEY SHALL BE PREPARED IN ACCORDANCE WITH APPROPRIATE GOVERNMENTAL REGULATIONS AND ZCA REQUIREMENTS. THE "AS-BUILT" SURVEY SHALL BE PREPARED ON ZCA'S DESIGN/PERMITTED PLANS. ELECTRONIC AND PAPER COPIES OF THE AS-BUILT SURVEY SHALL BE PROVIDED TO THE ENGINEER OF RECORD. THE "AS-BUILT" SHALL BE SIGNED AND SEALED BY A FLORIDA REGISTERED PROFESSIONAL LAND SURVEYOR.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING VEHICULAR AND PEDESTRIAN TRAFFIC SAFELY THROUGH THE WORK ZONE AT ALL TIMES, IF APPLICABLE. ANY SIDEWALK, LANE OR ROAD CLOSURE REQUIRES REVIEW AND APPROVAL IN ADVANCE AND A SEVEN (7) DAY MINIMUM NOTICE TO THE CITY OF PORT ORANGE PUBLIC WORKS DEPARTMENT (386-506-5750). THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REQUIRED COORDINATION.
11. MAINTENANCE OF TRAFFIC WILL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAY CONSTRUCTION, MAINTENANCE, AND UTILITY OPERATIONS AND THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD PLANS, LATEST EDITIONS.
12. CONTRACTOR TO NOTIFY THE REGULATORY AGENCIES FORTY EIGHT (48) HOURS PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR SHALL SEND COPIES OF ALL TESTING REPORTS TO THE REGULATORY AGENCIES AND THE ENGINEER OF RECORD.
13. SURVEY INFORMATION PROVIDED BY MARK WOOD & ASSOCIATES, INC. DATED JULY 2005. ALL ELEVATIONS BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29) AND ARE SHOWN IN FEET. STATE PLANE COORDINATES ARE BASED UPON NAD 83.
14. ALL PUBLIC LAND CORNERS AND MONUMENTS WITHIN THE LIMITS OF CONSTRUCTION ARE TO BE PROTECTED. THE CONTRACTOR SHALL EMPLOY A SURVEYOR, REGISTERED IN THE STATE OF FLORIDA, TO REPLACE/RESTORE ANY PROPERTY OR LAND MARKERS DISTURBED BY CONSTRUCTION ACTIVITIES.
15. NO LAND SHALL BE CLEARED, EXCAVATED OR FILLED AND NO STRUCTURES SHALL BE ERECTED, REPAIRED OR DEMOLISHED WITHOUT PROPER PERMIT(S).
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS AS WELL AS REQUIREMENTS OF ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND E.P.A. (NPDES). CONTRACTOR SHALL ESTABLISH BEST MANAGEMENT PRACTICES AND EROSION CONTROL METHODS PRIOR TO COMMENCING ANY SITE CLEARING OR DEMOLITION AND SHALL MAINTAIN THOSE BARRIERS UNTIL FINAL ACCEPTANCE OF THE PROJECT.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROJECT'S NPDES PERMITTING, INSPECTION AND REPORTING, IF APPLICABLE.
18. THE EROSION, SEDIMENT AND TURBIDITY CONTROL MEASURES DELINEATED HEREON ARE THE MINIMUM REQUIRED. ADDITIONAL CONTROLS MAY BE NEEDED, DEPENDING UPON THE ACTUAL SITE CONDITIONS. JURISDICTIONAL AGENCY PERMIT REQUIREMENTS AND CONSTRUCTION OPERATIONS, STAKED SILT FENCE SHALL BE UTILIZED TO CONTROL EROSION AND SEDIMENT TRACKING. SEDIMENT TRACKING CONTROL DEVICES SHALL BE USED TO PREVENT THE OFFSITE TRANSPORT OF SEDIMENT BY MOTORIZED VEHICLES. IF CONTROL MEASURES DO NOT PROVE SATISFACTORY, WORK SHALL CEASE UNTIL NEW MEASURES ARE ADOPTED WITH SATISFACTORY RESULTS.
19. ALL EROSION AND SEDIMENT TRACKING CONTROL DEVICES SHALL BE INSPECTED DAILY AND IMMEDIATELY FOLLOWING A RAINFALL EVENT. REFER TO PROJECT'S STORMWATER POLLUTION PREVENT PLAN (SWPPP). ANY DEFICIENCIES FOUND IN THE EROSION CONTROL MEASURES SHALL BE REPAIRED IMMEDIATELY. THE CONTRACTOR SHALL KEEP A LOG BOOK DOCUMENTING THESE DAILY INSPECTIONS, DEFICIENCIES AND REMEDIAL ACTIONS.
20. ALL UNSUITABLE SOILS AND UNSUITABLE MATERIALS (SUCH AS LEGAL, ORGANICS, ROCK, CEMENTED COQUINA, DEBRIS, ETC.) SHALL BE REMOVED, DISPOSED OF IN A LEGAL MANNER AND REPLACED WITH DRY COMPACTED GRANULAR MATERIAL SATISFACTORY TO THE CITY. THE COST OF ALL WORK AND MATERIALS IS TO BE INCLUDED IN THE UNIT PRICE OF THE ASSOCIATED CONSTRUCTION ITEMS UNLESS OTHERWISE SHOWN IN THE PLANS.
21. IN THE EVENT THAT WATER IS ENCOUNTERED DURING CONSTRUCTION, DEWATERING SHALL BE PERFORMED AS NEEDED. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, PERMITTING, INSTALLATION, OPERATION AND SUBSEQUENT REMOVAL OF DEWATERING SYSTEMS AND THEIR SAFETY AND CONFORMITY WITH APPLICABLE CODES AND REGULATIONS.
22. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE ELECTRIC, TELEPHONE, GAS, CABLE TELEVISION, COMMUNICATIONS, ETC. COMPANIES TO DETERMINE THE TYPE AND LOCATION OF ALL UNDERGROUND FACILITIES IN THE AREA OF CONSTRUCTION.
23. ALL UNDERGROUND UTILITIES HAVE BEEN LOCATED HORIZONTALLY AND VERTICALLY BASED ON THE BEST INFORMATION AVAILABLE AND SHOULD BE CONSIDERED APPROXIMATE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND VERIFYING ALL ELEVATIONS OF EXISTING UTILITIES (PUBLIC AND PRIVATE) SHOWN OR NOT SHOWN PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE VARIOUS UTILITY COMPANIES TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATION, DISRUPTION OF SERVICE OR CLARIFICATION OF ACTIVITY REGARDING SAID UTILITY. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING NEAR OR CROSSING A UTILITY, WHETHER SHOWN ON THESE PLANS OR FIELD LOCATED. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE AND NOTIFY THE UTILITY COMPANIES FOR UTILITIES WHICH NEED TO BE RELOCATED FOR THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE TO PAY FOR ANY REPAIR, RELOCATION OR TEMPORARY MEASURES NEEDED FOR EXISTING OR PROPOSED UTILITIES.
24. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND AVOID ALL UTILITIES, OTHER STRUCTURES AND OBSTRUCTIONS BOTH ABOVE AND BELOW GROUND. ALL DAMAGE RESULTING FROM THE CONTRACTOR'S FAILURE TO COMPLY WITH THIS REQUIREMENT SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
25. THE CONTRACTOR SHALL NOTIFY ALL UTILITY PROVIDERS AT LEAST TWO (2) BUSINESS DAYS PRIOR TO ANY CONSTRUCTION.
26. THE CONTRACTOR SHALL MAINTAIN UNINTERRUPTED SERVICE AT ALL SERVICE CONNECTIONS. THE MANNER IN WHICH THIS IS ACCOMPLISHED SHALL BE LEFT TO THE DISCRETION OF THE CONTRACTOR, SUBJECT TO THE REQUIREMENTS OF THE CONTRACT SPECIFICATIONS.
27. ALL EXISTING DRAINAGE STRUCTURES AND UTILITIES WITHIN THE CONSTRUCTION LIMITS SHALL REMAIN, UNLESS OTHERWISE NOTED IN PLANS.
28. THE LENGTH OF ALL DRAINAGE PIPES AND LOCATION OF ALL DRAINAGE STRUCTURES ARE APPROXIMATE. THE LOCATION OF THE DRAINAGE STRUCTURE SHALL DETERMINE THE LENGTH OF PIPE.
29. THE TOP OF CASTING ELEVATIONS (TC) OF ALL STRUCTURES ARE SHOWN. HOWEVER, THE CONTRACTOR SHALL INSTALL ALL FRAMES SO AS TO PROVIDE A SMOOTH SURFACE FOR VEHICULAR AND/OR PEDESTRIAN TRAFFIC.
30. CONTRACTOR SHALL CONFIRM PROPOSED TOP OF CASTING (TO) ELEVATIONS WILL ALLOW POSITIVE DRAINAGE TO PROPOSED INLETS. IF POSITIVE DRAINAGE DOES NOT EXIST, CONTRACTOR TO COORDINATE WITH ENGINEER OF RECORD FOR SOLUTION AND ADJUST PROPOSED INLETS AS NECESSARY.
31. CONTRACTOR SHALL CONFIRM ELEVATION OF EXISTING GRADE PRIOR TO PLACING DRAINAGE OUTFALL STRUCTURES. CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD IF EXISTING GRADE DOES NOT MATCH PROPOSED OUTFALL INVERT. CONTRACTOR SHALL ADJUST OUTFALL STRUCTURE INVERT AND/OR STRUCTURE LOCATION AS DIRECTED BY ENGINEER OF RECORD.
32. ANY DRAINAGE PROBLEMS CREATED BY CONSTRUCTION, OR EXISTING BEFORE CONSTRUCTION AND NOT ALLEVIATED, SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD AT THE TIME OF DISCOVERY.
33. ALL STORMWATER PIPES AND INLETS SHALL BE CLEANED OF DEBRIS AND ERODED MATERIALS AT LAST STAGES OF AND PRIOR TO COMPLETION OF CONSTRUCTION.

GENERAL NOTES

34. SPECIAL ATTENTION IS DIRECTED TO THE FACT THAT PORTIONS OF SOME DRAINAGE STRUCTURES MAY EXTEND INTO THE STABILIZED PORTION OF THE ROADBED. EXTREME CAUTION WILL BE NECESSARY DURING COMPACTION AND STABILIZATION OPERATIONS AT THESE LOCATIONS TO AVOID DAMAGE AND ACHIEVE THE REQUIRED COMPACTION.
35. DURING CONSTRUCTION, AN ALL-WEATHER ACCESSIBLE ROADWAY SHALL BE MAINTAINED AT ALL TIMES FOR FIRE ACCESS.
36. ALL REQUIRED FIRE LINES & HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL & STATE REQUIREMENTS AND OPERATIONAL PRIOR TO THE START OF VERTICAL CONSTRUCTION.
37. EXISTING DRIVEWAYS WITHIN THE LIMITS OF THIS PROJECT ARE TO BE REPLACED AT THE SAME LOCATION AND WIDTH WITH THE SAME TYPE OF MATERIAL, UNLESS OTHERWISE SHOWN IN THE PLANS.
38. ALL RAMPS, SIDEWALKS AND ACCESSIBLE ROUTES ARE TO BE IN COMPLIANCE WITH CURRENT A.D.A. REQUIREMENTS.
39. SIGNS THAT ARE REMOVED AND ARE TO BE RELOCATED SHALL BE STOCK PILED BY THE CONTRACTOR. ANY EXISTING SIGNS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT HIS COST.
40. ROADWAY AND PARKING SIGNAGE AND MARKINGS SHALL BE IN CONFORMANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.
41. GRADES SHOWN ARE FINISHED GRADES.
42. OPERATION AND MAINTENANCE OF THE STORMWATER SYSTEM WILL BE PROVIDED BY THE OWNER OF THE PROPERTY. MAINTENANCE IS TO INCLUDE BI-WEEKLY MOWING OF SIDE SLOPES FOR VEGETATION CONTROL AND MONTHLY INSPECTION/CLEANING OF CULVERTS & STORM SYSTEMS.
43. ALL DISTURBED AREAS SHALL BE SODED, UNLESS OTHERWISE SHOWN, AND SHALL HAVE SOO/VEGETATED COVER ESTABLISHED PRIOR TO THE INSPECTION FOR THE CERTIFICATE OF OCCUPANCY.
44. INSTALLATION OF THE REQUIRED STREET SIGNS, TRAFFIC SIGNS, PAVEMENT STRIPING, STREET LIGHTS AND SIDEWALKS ALONG WITH THE PAINTING OF THE FIRE HYDRANTS MUST BE COMPLETED PRIOR TO THE ISSUANCE OF THE CERTIFICATE OF COMPLETION.
45. CONTRACTOR IS RESPONSIBLE FOR INSPECTING AND PRE-TESTING PRIOR TO SCHEDULING A TEST OR WALK-THROUGH WITH THE UTILITY REPRESENTATIVES, MUNICIPAL REPRESENTATIVES AND ENGINEER OF RECORD. ANY COST ASSOCIATED WITH RETESTING SHALL BE PAID FOR BY THE CONTRACTOR.
46. THE ENGINEER OF RECORD AND LOCAL UTILITY SHALL BE GIVEN SEVENTY-TWO (72) HOURS NOTICE OF ALL REQUESTED MEETINGS AND/OR TESTING MEASURES.
47. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH THE REGULATORY REPRESENTATIVES TO DETERMINE THE INSPECTIONS NEED FOR THE PROJECT. CONTRACTOR SHALL PROVIDE PROPER NOTIFICATION TO INSPECTING AUTHORITIES BEFORE AND DURING CONSTRUCTION.

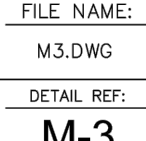
GENERAL NOTES

- THE FOLLOWING MEASURES REPRESENT MINIMUM STANDARDS TO BE ADHERED TO BY THE CONTRACTOR THROUGHOUT THE CONSTRUCTION OF A PROJECT. THE CITY ENGINEER HAS THE RIGHT TO REQUIRE ADDITIONAL MEASURES TO BE EMPLOYED AS WARRANTED BY CONDITIONS OR FOR THE FAILURE OF THE CONTRACTOR TO EMPLOY APPROPRIATE EROSION CONTROL BEST MANAGEMENT PRACTICES. FAILURE TO COMPLY WITH THESE PROVISIONS SHALL RESULT IN THE ISSUANCE OF A "STOP WORK ORDER".
1. NO DISTURBANCE OF PROPOSED CONSTRUCTION EASEMENTS, NATURAL BUFFERS, OR WATER BODIES IS PERMITTED. THE CONTRACTOR SHALL LOCATE THESE AREAS ON SITE AND BARRICADE THEM TO AVOID ANY UNAUTHORIZED CLEARING, BARRIERES AND OTHER PROTECTIVE FENCING ARE TO BE LOCATED AT THE DROP LINE OF EXISTING NATURAL TREES OR AT THE EDGE OF THE NATIVE UNDER-STORY HABITAT, WHICHEVER IS FURTHER.
 2. SPOILMEN AND HISTORIC TREES, CONSTRUCTION EASEMENTS, NATURAL VEGETATION BUFFERS, AND SPECIAL AREAS MUST BE PROTECTED BY BARRICADES OR FENCING PRIOR TO CLEARING. BARRICADES ARE TO BE SET AT THE DROP LINE OF THE TREES, AS SPECIFIED, AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. BARBED WIRE IS NOT PERMITTED AS A PROTECTIVE BARRIER.
 3. WHERE A CHANGE OF GRADE OCCURS WITHIN THE DROP LINE OF A SPECIFIED TREE, SILT FENCES WILL BE REQUIRED DURING CONSTRUCTION AND RETAINING WALLS MUST BE INSTALLED PRIOR TO FINAL ACCEPTANCE BY THE CITY.
 4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL PROTECTIVE VEGETATION BARRICADES AND EROSION CONTROL DEVICES MAINTAINED IN PLACE PRIOR TO THE COMMENCEMENT OF ANY EARTHWORK, INCLUDING PRELIMINARY GRUBBING, BEST MANAGEMENT PRACTICES (BMPs) ARE TO BE IMPLEMENTED, SUCH AS TEMPORARY CONSTRUCTION FENCES, SILT FENCES AND FLOATING TURBIDITY BARRIERS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL EROSION CONTROL DEVICES AND BARRICADES THROUGHOUT THE DURATION OF THE ENTIRE PROJECT. MAINTENANCE SHALL INCLUDE, BUT NOT LIMITED TO, PERIODIC INSPECTION AND REMOVAL OF DEBRIS AND/OR SEDIMENT FROM THE EROSION CONTROL DEVICES.
 5. PRIOR TO THE INSTALLATION OF ANY FILL MATERIALS ON SUBJECT SITE, SILT FENCES SHALL BE INSTALLED (1) ALONG SUBJECT SITE BOUNDARY AND/OR PROPERTY LINES, (2) AT THE EDGE OF CONSERVATION EASEMENTS AND WETLANDS, (3) ADJACENT TO NATURAL LANDSCAPE BUFFERS, (4) AROUND THE PERIMETER OF EXISTING STORM WATER TREATMENT FACILITIES, AND (5) AT ANY ADDITIONAL AREAS THAT THE CITY DEEMS NECESSARY TO BE PROTECTED FROM POTENTIAL EROSION IMPACTS DURING CONSTRUCTION. THESE CONSTRUCTION SHALL APPLY TO ALL AREAS, INCLUDING ANY ADDITIONAL AREAS THAT THE CITY DEEMS NECESSARY TO BE PROTECTED FROM POTENTIAL EROSION IMPACTS DURING CONSTRUCTION. THESE CONSTRUCTION SHALL APPLY TO ALL AREAS, INCLUDING ANY ADDITIONAL AREAS THAT THE CITY DEEMS NECESSARY TO BE PROTECTED FROM POTENTIAL EROSION IMPACTS DURING CONSTRUCTION. THESE CONSTRUCTION SHALL APPLY TO ALL AREAS, INCLUDING ANY ADDITIONAL AREAS THAT THE CITY DEEMS NECESSARY TO BE PROTECTED FROM POTENTIAL EROSION IMPACTS DURING CONSTRUCTION.
 6. WHERE FILL MATERIAL IS INTENDED TO BE INSTALLED ADJACENT TO EXISTING VEGETATION WHICH IS INTENDED TO REMAIN NATURAL, THE CONTRACTOR SHALL MAINTAIN THE EXISTING VEGETATION. INSTEAD, IN LIEU OF INSTALLING WOOD BRACING WITH ORANGE MESH, THIS PRACTICE IS ENCOURAGED BY THE CITY. IF THE SILT FENCES ARE NOT MAINTAINED, ADEQUATE PROTECTION FROM IMPACT DUE TO CONSTRUCTION, THEN BARRICADES OR WOOD BRACING SHALL BE REQUIRED.
 7. AT A MINIMUM, THE CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED AREAS. SUFFICIENT GRASS COVERAGE IS TO BE ESTABLISHED WITHIN TWO WEEKS.
 8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR THROUGH SCHEDULING, TO MINIMIZE THE DISTURBANCE OF SITE AREAS THAT HAVE BEEN BROUGHT TO THEIR PROPOSED FINAL GRADE WITHIN SEVEN (7) DAYS OF BRINGING A SUBJECT AREA TO ITS FINAL GRADE OR INACTIVITY IN CONSTRUCTION. THE CONTRACTOR SHALL INSTALL SEED AND MULCH OR SOO, AS REQUIRED.



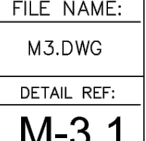
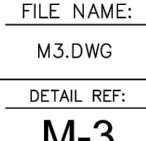
STANDARD CONSTRUCTION DETAIL
CONTRACTOR REQUIREMENTS FOR
SITE CLEARING, GRADING, AND EROSION CONTROL
DESIGN AND CONSTRUCTION

REV. 12/18



STANDARD CONSTRUCTION DETAIL
CONTRACTOR REQUIREMENTS FOR
SITE CLEARING, GRADING, AND EROSION CONTROL
DESIGN AND CONSTRUCTION
(CONTINUED)

REV. 12/18



FILE NAME:
M3.DWG
DETAIL REF:
M-3

FILE NAME:
M3.DWG
DETAIL REF:
M-3.1

SCOPE OF WORK

FURNISH AND INSTALL SOO, OR SEED AND MULCH, THE LIMITS CALLED FOR ON THE CONSTRUCTION DRAWINGS. AT A MINIMUM, ALL WORK SHALL MEET THE MINIMUM STANDARDS OF SECTION 270 OF THE PORT ORANGE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, AND MINIMUM REQUIREMENTS OF THE CITY, AS OUTLINED BELOW.

SEED SHALL BE PRE-MIXED BY A SEED COMPANY TO THE PERCENTAGES DESCRIBED BELOW, WITH CERTIFICATION FROM THE SUPPLIER PROVIDED TO THE CITY'S DESIGNATED LANDSCAPE INSPECTOR PRIOR TO USE. THE GRASS SEED MIXTURE SHALL BE:

PENSACOLA BAHIA (USE 50% SCARIFIED SEED) 50%
HULLED BENEDICTA 25%
BROWN TOP MILLET 25%

NOTE: IN THE FALL AND WINTER MONTHS, AND WITH THE APPROVAL OF THE CITY, ANNUAL RYE GRASS SHALL BE SUBSTITUTED IN EQUAL AMOUNTS FOR THE BROWN TOP MILLET.

MULCH

STRAW OR ANY CONSISTING OF OATS, RYE, OR WHEAT, STRAW, OR OF PANDOLA, PEANUT, COQUINA, BENTONITE OR BAHIA GRASS MAY. MULCH SHALL BE FREE FROM WEEDS AND OTHER UNDESIRABLE GRASSES. APPROXIMATELY ONE INCH (1") LOOSE THICKNESS OF MULCH MATERIAL SHALL BE APPLIED UNIFORMLY OVER THE SEEDED AREAS (APPROXIMATELY ONE AND ONE-HALF (1-1/2) BALES PER 1000 SQUARE FEET). THE MULCH MATERIAL SHALL BE CUT INTO THE SOIL WITH A DISC HARROW OR OTHERWISE ANCHORED DOWN, UNDER PROPER CIRCUMSTANCES. CONTRACTOR MAY REQUEST OPTION TO INSTALL HYDRO-SEEDING, SUBJECT TO THE APPROVAL OF THE PROJECT LANDSCAPE ARCHITECT AND THE CITY.

METHOD

GRASSING SHALL BE DONE IMMEDIATELY UPON COMPLETION OF THE FINE GRADING OPERATION. HOWEVER, NO SEEDING SHALL BE DONE WHEN THE GROUND IS FROZEN OR UNDULY WET. THE RATE OF SPREAD FOR THE SEED MATERIAL SHALL BE ONE HUNDRED AND THIRTY (130) POUNDS PER ACRE.

IN ORDER TO ENSURE THAT NEW SUBDIVISIONS AND SITE PLANS ARE CONSTRUCTED SUBSTANTIALLY IN ACCORDANCE WITH CITY REGULATIONS AND THE APPROVED DRAWINGS, THE FOLLOWING INFORMATION IS REQUIRED ON ALL AS-BUILT DRAWINGS:

1. INDIVIDUAL PLAN AND PROFILE SHEETS FOR ALL ROADS AND SANITARY SEWER LINES, SHOWING MANHOLES, INLETS, AND PIPE CROSSINGS. PLAN AND PROFILE SHEETS SHALL SHOW SANITARY LINES AND ALL OTHER BURIED UTILITIES THAT CROSS SEWER LINES, AND ANY THAT ARE PARALLEL AND WITHIN TWO FEET OF SANITARY SEWER LINES. PLAN VIEWS SHALL BE DRAWN AT A SCALE OF ONE (1) INCH EQUAL TO FOUR (4) FEET HORIZONTAL. PROFILES SHALL BE DRAWN AT ONE (1) INCH EQUAL TO FOUR (4) FEET VERTICAL AND ADJUSTED VERTICALLY WITH IMPROVEMENTS SHOWN ON THE PLAN VIEW.
2. DESIGN ELEMENTS SHALL BE CROSSED OUT AND AS-BUILT INFORMATION WRITTEN NEXT TO IT.
3. PAVEMENT AND CURB WIDTHS SHALL BE VERIFIED AND DIMENSIONED FOR EACH STREET AT EACH BLOCK FOR SUBDIVISIONS AND AS APPROPRIATE TO CONFORM WITH PLANS FOR THE PROJECT.
4. ALL RADI AT INTERSECTIONS SHALL BE VERIFIED, DIMENSIONED AND CLEARLY INDICATED ON THE AS-BUILT.
5. ROADWAY ELEVATIONS AT CENTRILINE AND CURB INVERT SHALL BE RECORDED AT ALL GRADE CHANGES, 300' INTERVALS FOR LONG ROADWAYS, AND OTHER INTERVALS AS NEEDED. FOR SUBDIVISIONS, THE AS-BUILT CENTRILINE GRADE LINES OF ALL STREETS SHALL BE SHOWN ON THE PLAN AND PROFILE ALONG WITH THE DESIGN PROFILE GRADE LINES. IN THE EVENT THAT THE AS-BUILT CENTRILINE LONGITUDINAL GRADE DOES NOT MEET THE CITY MINIMUM STANDARDS, ADDITIONAL LONGITUDINAL GRADES OF THE ADJACENT CULVERTS AND SIMILAR ROADWAY CROSS-SECTIONS SHALL BE REQUIRED TO VERIFY THAT THE SYSTEM WILL FUNCTION AS ORIGINALLY DESIGNED.
6. FOR SUBDIVISIONS, PROPOSED DESIGN FINISHED FLOOR ELEVATIONS SHALL APPEAR ON ALL SUBDIVISION LOTS ON THE APPROPRIATE PLAN AND PROFILE SHEET AS WELL AS ON THE MASTER DRAINAGE PLAN.
7. STORM DRAINAGE STRUCTURES SHALL BE LOCATED AND DIMENSIONED FROM STREET/ROADWAY CENTERLINES OR LOT LINES AS APPROPRIATE. STORM DRAINAGE PIPES SHALL BE LOCATED AND DIMENSIONED FROM THE BACK OF CURB, OR EDGE OF PAVEMENT IF NO CURB IS PRESENT. FORCE MAIN PIPES SHALL BE LOCATED AND DIMENSIONED FROM THE BACK OF CURB, OR EDGE OF PAVEMENT IF NO CURB IS PRESENT. FORCE MAIN PIPE MATERIAL, LENGTH, AND SIZE SHALL BE RECORDED AND CLEARLY INDICATED AS BEING AS-BUILT INFORMATION.
8. STORM DRAINAGE STRUCTURE RIMS, PIPE INVERT AND INLET BOTTOM ELEVATIONS SHALL BE RECORDED AND CLEARLY INDICATED AS BEING AS-BUILT INFORMATION. STORM DRAINAGE PIPE MATERIAL, LENGTH, AND SIZE SHALL BE RECORDED AND CLEARLY INDICATED AS BEING AS-BUILT INFORMATION.
9. ALL APPLICABLE TOPOGRAPHIC INFORMATION PERTINENT TO THE ON-SITE DRAINAGE SYSTEM, SUCH AS DITCHES, SWALES, LAKES, CANALS, ETC. THAT ARE DEEMED NECESSARY BY THE CITY TO VERIFY THE FUNCTIONAL PERFORMANCE OF THE STORMWATER SYSTEM, SHALL BE NOTED. NORMALLY, RECORDING ELEVATIONS EVERY 100' OF THE TOP OF BANK AND THE TOP OF SLOPE WILL BE REQUIRED. THE MEASUREMENTS SHALL BE TAKEN AND RECORDED IN ORDER TO ACCURATELY TIE DOWN THESE FEATURES TO THE ROADWAY CENTERLINES AND TO PLAT LINES. WHENEVER POSSIBLE, CONTOUR LINES SHALL BE UTILIZED TO GRAPHICALLY DESCRIBE THESE TOPOGRAPHIC FEATURES.
10. RETENTION AREAS SHALL HAVE THEIR TOP AND BOTTOM OF BANK ELEVATIONS RECORDED. ACTUAL DIMENSIONS OF THE SIZE OF ALL RETENTION AREAS ARE TO BE RECORDED AS MEASURED FROM TOP-OF-BANK TO TOP-OF-BANK WITH SLOPE INDICATED.
11. ACTUAL MATERIALS USED AND ELEVATIONS AND DIMENSIONS OF OVERFLOW WEIR STRUCTURES AND SKIMMERS SHALL BE NOTED ON THE AS-BUILT.
12. STORM DRAINAGE SWALE CENTERLINES SHALL BE LOCATED AND ELEVATIONS OF FLOW LINE AND TOPS OF BANKS SHALL BE RECORDED EVERY 100 FEET. SIDE SLOPES SHALL ALSO BE INDICATED.



STANDARD CONSTRUCTION DETAIL
REQUIREMENTS FOR AS-BUILT DRAWINGS

REV. 12/18



STANDARD CONSTRUCTION DETAIL
REQUIREMENTS FOR AS-BUILT DRAWINGS
(CONTINUED)

REV. 12/18



FILE NAME:
MS.DOC
DETAIL REF:
M-5.1

FILE NAME:
MS.DOC
DETAIL REF:
W-1

	WATER	STORM GRAVITY	STORM FORCE	RECLAIM	SANITARY GRAVITY	SANITARY FORCE
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"

	WATER	STORM GRAVITY	STORM FORCE	RECLAIM	SANITARY GRAVITY	SANITARY FORCE
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
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UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"	UNDER STORM FORCE 12"	UNDER RECLAIM 12"	UNDER SANITARY GRAVITY 12"	UNDER SANITARY FORCE 12"
OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
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OVER WATER	12"	OVER STORM GRAVITY 6", PREFERRED 12"	OVER STORM FORCE 12"	OVER RECLAIM 12"	OVER SANITARY GRAVITY 6", PREFERRED 12"	OVER SANITARY FORCE 12"
UNDER WATER	12"	UNDER STORM GRAVITY 12"				

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STANDARD CONSTRUCTION DETAIL
POTABLE WATER CONSTRUCTION NOTES
(CONTINUED)

FILE NAME
W3.DOC

DETAIL REF:
W-2.2

REV. 12/18



STANDARD CONSTRUCTION DETAIL
POTABLE WATER APPROVED
PRODUCTS

FILE NAME
W3.DOC

DETAIL REF:
W-3

REV. 12/18



STANDARD CONSTRUCTION DETAIL
SANITARY SEWER NOTES
(CONTINUED)

FILE NAME
S1.DOC

DETAIL REF:
S-1.1

REV. 12/18



STANDARD CONSTRUCTION DETAIL
SANITARY SEWER NOTES
(CONTINUED)

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STANDARD CONSTRUCTION DETAIL
POTABLE WATER APPROVED
PRODUCTS

FILE NAME
W3.DOC

DETAIL REF:
W-3.1

REV. 12/18



STANDARD CONSTRUCTION DETAIL
POTABLE WATER APPROVED
PRODUCTS

FILE NAME
W3.DOC

DETAIL REF:
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STANDARD CONSTRUCTION DETAIL
SANITARY SEWER NOTES

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S-1

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STANDARD CONSTRUCTION DETAIL
STORM DRAINAGE DESIGN
AND CONSTRUCTION NOTES

FILE NAME
ST1.DOC

DETAIL REF:
ST-1

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STANDARD CONSTRUCTION DETAIL
STORM DRAINAGE DESIGN
AND CONSTRUCTION NOTES
(CONTINUED)

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STANDARD CONSTRUCTION DETAIL
STORM DRAINAGE DESIGN
AND CONSTRUCTION NOTES
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STANDARD CONSTRUCTION DETAIL
STORM DRAINAGE DESIGN
AND CONSTRUCTION NOTES
(CONTINUED)

FILE NAME
ST1.DOC

DETAIL REF:
ST-1.3

REV. 12/18



Know what's below.
Call before you dig.

PROJECT NO.: ZC 2000S

DESIGNED BY: JD

DRAFTED BY: TR

CHECKED BY: JD

DRAWING FILE: 02-03-2000S_NOT

XREFS: -

XREFS: -

SHEET: C3 OF 7



ZEV COHEN & ASSOCIATES, INC.
REGISTERED PROFESSIONAL ENGINEER
FLORIDA LICENSE NO. 13375
10000 BRANCH, SUITE 100
FORT MYERS, FL 33907
WWW.ZEVCOHEN.COM

CIVIL ENGINEERING

LANDSCAPE ARCHITECTURE

ENVIRONMENTAL PLANNING

TRANSPORTATION

VOLUSIA COUNTY NOTES

1. NOTIFY VOLUSIA COUNTY DEVELOPMENT ENGINEERING DIVISION AT (386) 736-5926 A MINIMUM OF 24 HOURS PRIOR TO THE START OF CONSTRUCTION. FAILURE OF THE PERMITTEE TO OBTAIN THE APPROPRIATE INSPECTIONS PRIOR TO PROCEEDING WITH WORK SHALL NOT RELIEVE THE PERMITTEE FROM REEXCAVATION OR OTHER MEASURES NECESSARY FOR THE INSPECTION OF WORK..
2. VOLUSIA COUNTY TRAFFIC ENGINEERING (386) 736-5968 IS NOT A MEMBER OF SUNSHINE ONE CALL. WHEN REQUESTING LOCATES, PLEASE PROVIDE A MINIMUM ADVANCED NOTIFICATION OF TWO (2) BUSINESS DAYS PRIOR TO PROPOSED WORK.
3. COORDINATION WITH VOLUSIA COUNTY TRAFFIC OPERATIONS (386) 239-6535 IS REQUIRED WITH A MINIMUM ADVANCED NOTICE OF SEVEN (7) DAYS PRIOR TO ANY SIDEWALK, LANE OR ROAD CLOSURE (INCLUDING FLAGGING OPERATIONS).
4. OPERATIONS WITHIN THE COUNTY RIGHT-OF-WAY SHALL NORMALLY BE CONDUCTED 7:00 AM TO 7:00 PM, MONDAY THROUGH FRIDAY. ANY DEVIATION FROM THESE HOURS REQUIRES PRIOR APPROVAL FROM THE COUNTY DEVELOPMENT ENGINEER. EMERGENCY REPAIRS ARE EXCLUDED FROM THIS TIME RESTRICTION.
5. ALL EXISTING SIDEWALKS WITHIN COUNTY RIGHT-OF-WAY SHALL EITHER REMAIN OPEN OR BE PROVIDED A TEMPORARY WALKWAY IN ACCORDANCE WITH THE CURRENT VERSION OF FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD INDEX #102-660. ANY DAMAGE TO SIDEWALKS SHALL BE REPAIRED AND/OR REPLACED IN LIKE KIND BY THE CONTRACTOR. NEW SIDEWALKS AND SECTIONS THROUGH DRIVEWAYS MUST BE AT A 1.5% CROSS SLOPE AND 2% MAXIMUM CROSS SLOPE PER ADA STANDARDS.
6. DRIVING OR STAGING OF CONSTRUCTION VEHICLES OR MATERIALS IS NOT PERMITTED WITHIN THE COUNTY RIGHT-OF-WAY OR ON PEDESTRIAN WALKWAYS AND PATHS. THERE SHALL BE NO OVERNIGHT CONSTRUCTION VEHICLE RELATED PARKING, CONSTRUCTION MATERIAL PLACEMENT OR STORAGE OF ANY KIND PERMITTED WITHIN THE COUNTY RIGHT-OF-WAY.
7. NO TRENCH OR EXCAVATION SHALL BE LEFT OPEN OR UNATTENDED OVERNIGHT, UNLESS APPROVED BY THE COUNTY DEVELOPMENT ENGINEERING INSPECTOR. EXCAVATIONS SHALL MEET THE DROP OFF PROTECTION REQUIREMENTS OF THE LATEST FDOT DESIGN STANDARD INDEX #102-600.
8. RESTORATION SHALL BE REQUIRED FOR ANY DAMAGE TO SIDEWALKS, CURBS, OR OTHER EXISTING STRUCTURES IN THE RIGHT-OF-WAY. ALL DISTURBED AREAS WITHIN THE COUNTY RIGHT OF WAY SHALL BE RE-GRADED AND SODDED. SEED AND MULCH IS NOT AN ACCEPTABLE ALTERNATIVE TO SODDING.

7. MANHOLE RIMS SHALL MATCH FLUSH WITH THE FINISH GRADE ELEVATION IN PAVED AREAS AND A MINIMUM OF 12" ABOVE GRADE ELEVATION IN UNPAVED AREAS.
 8. ALL SANITARY SEWER MANHOLE COVERS SHALL HAVE THE WORDS "PORT ORANGE FLORIDA SANITARY SEWER" CASTED THEREIN.
 9. THE CONTRACTOR SHALL CONTRAST SANITARY SEWER MANHOLES IN SUCH A WAY THAT SANITARY SEWS DO NOT INTERSECT SLOPED JOINTS BETWEEN SECTIONS OF THE MANHOLE.
 10. NO BUG HOLES OR HONEYCOMBS WILL BE ACCEPTED.
 11. INDIVIDUAL SANITARY SERVICE OR NEW CONSTRUCTION SHALL NOT BE CONNECTED DIRECTLY INTO MANHOLES. THE SERVICE CONNECTION WILL BE BY USE OF VEE CONNECTIONS, UNLESS OTHERWISE APPROVED BY THE CITY.
 12. RUBBER BOOTS WITH 18" STAINLESS STEEL BANDS SHALL BE UTILIZED IN THE CONNECTION AND SEAL INSIDE PROTECTION WITH HYDRAULIC CEMENT.
 13. EZ-WRAP PLASTIC, AS MANUFACTURED BY PRESS SEAL GASKET CORPORATION, SHALL BE USED ON THE OUTSIDE OF ALL MANHOLE AND WELL JOINTS. APPLY ONE LAYER OF 9" WRAP CENTERED ON EACH JOINT. A CITY INSPECTOR SHALL PERSONALLY INSPECT ALL JOINT SEALS PRIOR TO BACKFILLING OPERATIONS.
- TESTING:**
1. ALL TESTING REQUIRED BY THE CITY SHALL BE PAID FOR BY THE CONTRACTOR / DEVELOPER. THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY AT HIS OWN EXPENSE.
 2. TO ENSURE THAT CONNECTION OF ALL FILL MATERIAL IS COMPLETED PROPERLY, TESTS SHALL BE DONE 12" ABOVE THE PIPE AND THEN AT 12" VERTICAL INTERVALS UNTIL FINAL GRADE IS REACHED.
 3. ALL TRENCHES SHALL BE BACKFILLED WITH ACCEPTABLE MATERIAL AND COMPACTED TO A MINIMUM 90% IN UNPAVED AREAS AND 98% IN PAVED AREAS OF THE MAXIMUM DENSITY BASED ON AASHTO T-15 MODIFIED PROCTOR TEST.
 4. TEST RESULTS SHALL BE SUBMITTED TO THE CITY AT A MINIMUM FREQUENCY OF ONE SET OF TESTS BETWEEN EACH MANHOLE AND ONE ADDITIONAL SET OF TESTS AT EVERY MANHOLE. IDENTIFICATION OF TEST LOCATIONS SHALL BE CLEARLY INDICATED ON TEST REPORTS. TEST RESULTS SHALL BE FORWARDED PROMPTLY TO THE CITY'S DESIGNATED SITE INSPECTOR.
- CLOSE-OUT:**
1. ALL SEWER MAINS, PRIOR TO FINAL ACCEPTANCE BY THE CITY AND PRIOR TO ANY FINAL PAYING OPERATIONS, SHALL BE TESTED AND SUBMITTED TO THE CITY USING A "P" AND "T" CAMERA WITH DEPTH GAUGE IN FRONT OF THE CAMERA BY A CITY APPROVED CONTRACTOR. THE CAMERA SHALL RUN FROM DOWNSTREAM MANHOLE TO UP STREAM MANHOLE. CITY INSPECTOR SHALL BE NOTIFIED IN ADVANCE AND BE PRESENT DURING THE TELEVISION OF THE SEWER SYSTEM. THE VIDEO SHALL BE NON-STOP WITH AUDIO DESCRIBING WHAT IS BEING REVIEWED. WRITTEN VIDEO LOG DESCRIBING THE CONDITION OF THE LINES SHALL ACCOMPANY THE VIDEO SUBMISSION TO THE CITY 48 HOURS PRIOR TO COMMENCING ANY INSTALLATION OF ASPHALT OR CONCRETE PAVEMENT. THE CITY MAY REQUIRE ADDITIONAL VIDEO TAPING, VIDEO TAPING OF LATERALS, AND/OR INFILTRATION/EXTRATION TESTS IF DEFECTS ARE APPARENT OR WORKMANSHIP IS QUESTIONABLE.
 2. UPON CONSTRUCTION COMPLETION AND ACCEPTANCE OF THE SYSTEM, IT SHALL BE THE DESIGN ENGINEER'S RESPONSIBILITY TO ENSURE THAT THE SYSTEM IS PROPERLY CERTIFIED AND ACCEPTED BY THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AND AS-BUILTS ARE PROVIDED TO THE CITY PRIOR TO ANY USE OF THE SYSTEM.



STANDARD CONSTRUCTION DETAIL
SANITARY SEWER NOTES
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17. SEWER LATERAL LOCATIONS SHALL BE MARKED ALONG THE OUTSIDE OF THE CURB WITH A SAW CUT "Y", OR BY A METAL TAB SET INTO THE PAVEMENT.
 18. THE CONTRACTOR SHALL INSTALL A METALLIZED FOL LOCATOR TAP, OR SIMILAR DEVICE AS MAY BE APPROVED BY THE CITY FOR THE FULL LENGTH OF ALL PVC SEWAGE FORCE MAINS. THIS PIPE LOCATOR AID SHALL BE INSTALLED BETWEEN 12" AND 24" BELOW FINISHED GRADE OR AS DIRECTED BY THE MANUFACTURER. TAPE SHALL BE COLOR CODED GREEN FOR SANITARY SEWER AND FORCE MAIN. A CONTINUOUS NO. 10 COPPER HEAD WIRE SHALL BE INSTALLED WITH WIRE BROUGHT UP AT ALL VALVES.
- FORCE MAIN SANITARY SEWERS:**
1. PVC SANITARY SEWER FORCE MAINS, INCLUDING FITTINGS, SHALL BE GREEN PVC AWWA C-900, OR C-905, UNLESS SPECIFICALLY NOTED OTHERWISE. PRESSURE FITTINGS SHALL BE PRESSURE CLASS 150 OR C-907.
 2. HDPE SANITARY SEWER FORCE MAINS SHALL BE 30% (OR THICKER) UNLESS SPECIFICALLY NOTED OTHERWISE. THE HOPE PIPE SHALL BE SIZED TO MATCH THE EXISTENTIAL DIAMETER OF THE PVC TO WHICH IT IS ATTACHED. PRESSURE FITTINGS SHALL BE PRESSURE CLASS 150 OR C-907.
 3. ALL SANITARY SEWER FORCE MAINS SHALL USE A THRUST RESTRAINT JOINT METHOD IN COMPLIANCE WITH THE DUCTILE IRON PIPE RESEARCH ASSOCIATION GUIDELINES MODIFIED TO ACCOMMODATE PVC PIPE BY FOLLOWING THE RECOMMENDED INCREASE IN RESTRAINT LENGTH CORRESPONDING TO THE INSTALLATION OF POLYETHYLENE WRAP. IN NO INSTANCE SHALL THRUST BLOCKS BE PERMITTED.
 4. ALL IN-LINE SANITARY SEWER FORCE MAIN VALVES SHALL BE AWWA C-509 OR C-515 COMPLIANT RESILIENT SEAT VALVES FEATURING AN EPOXY LINER DUCTILE IRON BODY.
 5. FORCE MAIN SYSTEMS SHALL BE PRESSURE TESTED AT 100 PSI STATIC PRESSURE FOR A PERIOD OF 2 HOURS PER AWWA STANDARDS.
 6. FORCE MAINS SHALL BE FLUSHED, PRESSURE TESTED, PIGGED AND CLEARED FOR SERVICE IN ACCORDANCE WITH THE LATEST AWWA STANDARDS AND THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION REQUIREMENTS. THE CONTRACTOR SHALL NOTIFY THE CITY'S DESIGNATED SITE INSPECTOR WHO SHALL COORDINATE WITH CITY PERSONNEL AT THE WATER OR WASTEWATER TREATMENT PLANT (AS APPROPRIATE) AT LEAST 48 HOURS PRIOR TO BEGINNING A FULL-DIAMETER FLUSH OF THE MAINS AND PRIOR TO THE COMMENCEMENT OF PRESSURE TESTING (SUBJECT TO AVAILABILITY).
 7. THE CONTRACTOR SHALL BE REQUIRED TO PIG ALL FORCE MAINS AND PRIMARY TRANSMISSION MAINS LOCATED ON COLLECTOR AND ARTERIAL ROADWAYS. LAUNCHING AND EXTRACTION POINTS SHALL BE DETERMINED BY THE CONTRACTOR. ALL PIGGING OPERATIONS SHALL BE WITNESSED BY A PORT ORANGE REPRESENTATIVE.
- SANITARY MANHOLES:**
1. STANDARD MANHOLES SHALL BE LOCATED AT INTERVALS NOT EXCEEDING 350'. SHOP DRAWINGS FOR ALL STRUCTURES SHALL BE SUBMITTED TO AND APPROVED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION WITH TWO COPIES FORWARDED BY THE DESIGN ENGINEER TO THE CITY.
 2. MAXIMUM DEPTH OF SANITARY MANHOLES SHALL BE 15'.
 3. LOCAL COLLECTION SANITARY SEWER MANHOLES SHALL BE PRECAST WITH A MINIMUM INSIDE DIAMETER OF 48". THICKER MANHOLE WALLS AND BASES MAY BE REQUIRED TO PREVENT FLOATION BASED ON HIGH GROUND WATER TABLES. ONE INCH CONSTRUCTION TOLERANCE SHALL BE ACCEPTED FOR ALL SANITARY MANHOLES.
 5. ALL SANITARY SEWER MANHOLES SHALL HAVE ALL INTERIOR SURFACES COATED WITH THREE (3) COATS OF WHITEGRAY OVER RED OVER BLACK DWS-1 EPOXY PAINT WITH A TOTAL OF 12 MILS THICKNESS OR BLACK COAL-TAR EPOXY PAINT WITH A TOTAL OF 16 MILS THICKNESS. OUTSIDE SURFACE TO BE COATED WITH TWO (2) COATS OF BLACK OVER BLACK E-W-1 EPOXY PAINT WITH A TOTAL OF 8 MILS AND ONE (1) COAT OF BLACK COAL-TAR EPOXY WITH A TOTAL OF 8 MILS. ALL COATS SHALL BE APPLIED AT THE FACTORY EXCEPT MINOR FIELD TOUCH UP AT JOINTS AND AT MANHOLE NECK.
 6. ALL MANHOLES CONSTRUCTED IN SIDE YARDS, BACKYARDS, AND EASEMENTS OUTSIDE OF THE RIGHT-OF-WAY SHALL BE OUTFITTED WITH FIBERGLASS OR FPOXY LINERS IN COMPLIANCE WITH ASTM-F753 OR OTHER TYPES OF LINES APPROVED BY THE CITY. IN ADDITION, THE CITY MAY REQUIRE LINES TO BE INSTALLED IN OTHER AREAS WHERE THE PUBLIC UTILITIES DEPARTMENT BELIEVES THE NEED IS JUSTIFIED SUCH AS IMMEDIATELY UPSTREAM OF FORCE MAINS CONNECTING TO SANITARY MAINS.



STANDARD CONSTRUCTION DETAIL
SANITARY SEWER NOTES
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SANITARY SEWER NOTES
(CONTINUED)

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STANDARD CONSTRUCTION DETAIL
SANITARY SEWER NOTES
(CONTINUED)

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STANDARD CONSTRUCTION DETAIL
STORM DRAINAGE DESIGN
AND CONSTRUCTION NOTES
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DETAIL REF:
ST-1.2

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STANDARD CONSTRUCTION DETAIL
STORM DRAINAGE DESIGN
AND CONSTRUCTION NOTES
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STORM DRAINAGE DESIGN
AND CONSTRUCTION NOTES
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STANDARD CONSTRUCTION DETAIL
STORM DRAINAGE DESIGN
AND CONSTRUCTION NOTES

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ST-1

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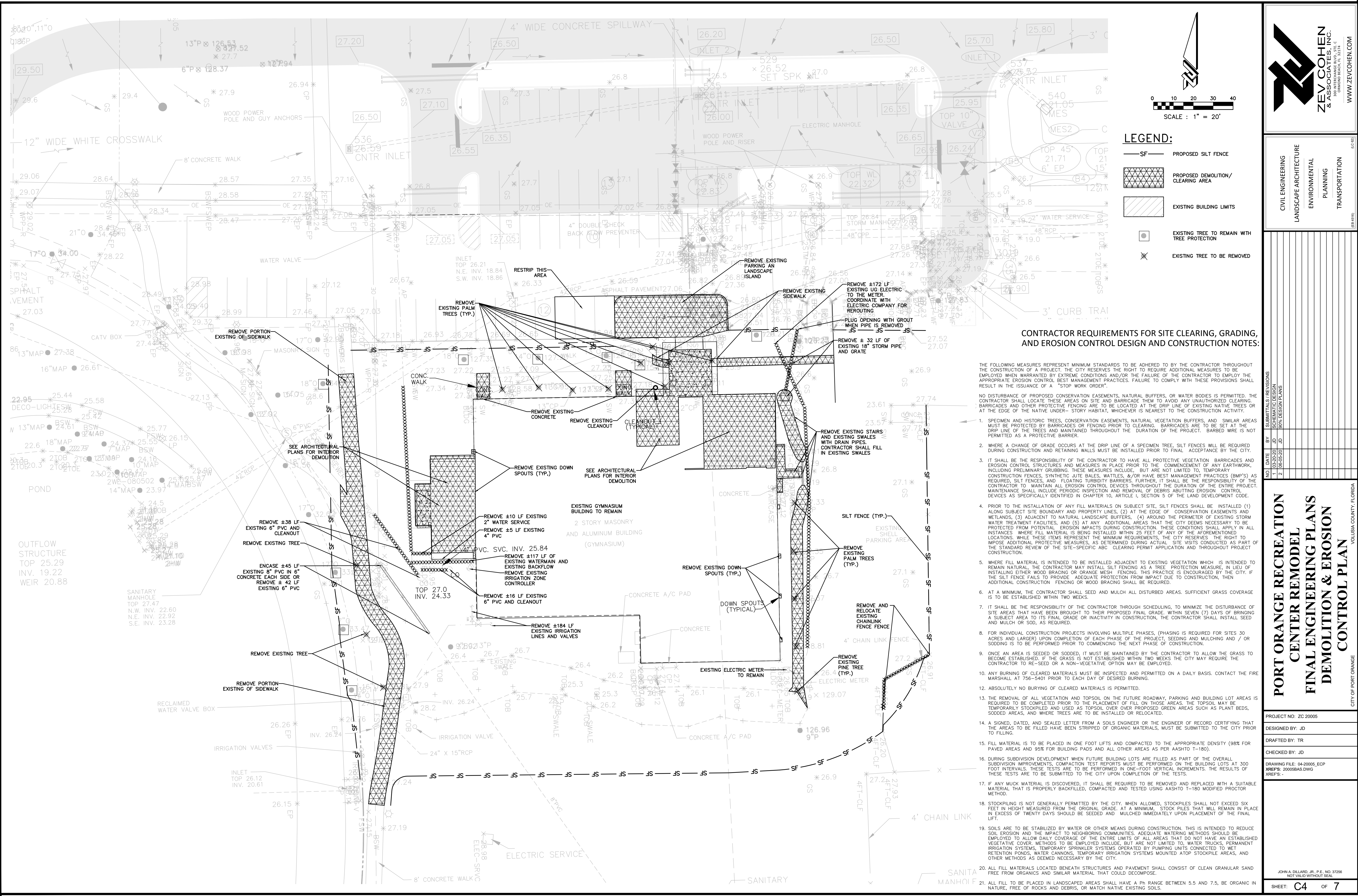
FIRE HYDRANT (5 1/2" BARREL)									
MANUFACTURER		MODEL #		MANUFACTURER		MODEL #		MANUFACTURER	
AMERICAN AWC CO.		SERIES #2780		AMERICAN AWC CO.		SERIES 3, 18, 25, 45, 55, 8, 66		AMERICAN AWC CO.	
AMERICAN DARLING		5 1/2" B-84-B5		AMERICAN FLOW CONTROL		SERIES 2500		AMERICAN FLOW CONTROL	
CLOW		MEDALLION #F-2545 55		CLOW		MODEL 2628 AND 2639		CLOW	
EJ GROUP, INC.		GUARDMASTER 5" #5C0250		KENDNEY		C509, C515		KENDNEY	
MUELLER		GUARDIAN K81-D		MUELLER		A-2360, A-2361, T-2360 & T-2361		MUELLER	
MUELLER		A423 SUPER CENTURION 250							

AIR RELEASE VALVES									
MANUFACTURER		MODEL #		MANUFACTURER		MODEL #		MANUFACTURER	
VENTO-MAT		RBX 2521							

GATE VALVES AND TAPPING VALVES – RESILIENT SEATED (AWWA C509 AND C515) 24" OR SMALLER V-WEDGE TO BE COMPLETE ENCLOSED WITH EPDM RUBBER)									
MANUFACTURER		MODEL #		MANUFACTURER		MODEL #		MANUFACTURER	
AMERICAN AWC CO.		SERIES 3, 18, 25, 45, 55, 8, 66		AMERICAN AWC CO.		SERIES 3, 18, 25, 45, 55, 8, 66		AMERICAN AWC CO.	
AMERICAN FLOW CONTROL		SERIES 2500		AMERICAN FLOW CONTROL		SERIES 2500		AMERICAN FLOW CONTROL	
CLOW		MODEL 2628 AND 2639		CLOW		MODEL 2628 AND 2639		CLOW	
KENDNEY		C509, C515		KENDNEY		C509, C515		KENDNEY	
MUELLER		A-2360, A-2361, T-2360 & T-2361		MUELLER		A-2360, A-2361, T-2360 & T-2361		MUELLER	

NEW OR RELOCATED, UNDERGROUND MAINS SHALL BE LAID TO PROVIDE THE FOLLOWING MINIMUM CROSSING/VERTICAL SEPARATIONS (OUTSIDE TO OUTSIDE):											
WATER		STORM GRAVITY		STORM FORCE		RECLAIM		SANITARY GRAVITY		SANITARY FORCE	
WATER		OVER STORM GRAVITY 6", PREFERRED 12"		OVER STORM FORCE 12"		OVER RECLAIM 12"		OVER SANITARY GRAVITY 6", PREFERRED 12"		OVER SANITARY FORCE 12"	
		UNDER STORM GRAVITY 12"		UNDER STORM FORCE 12"		UNDER RECLAIM 12"		UNDER SANITARY GRAVITY 12"		UNDER SANITARY FORCE 12"	
STORM GRAVITY		OVER WATER 12"		OVER STORM FORCE 6"		OVER RECLAIM 6", PREFERRED 12"		OVER SANITARY GRAVITY 6", PREFERRED 12"		OVER SANITARY FORCE 6", PREFERRED 12"	
		UNDER WATER 6", PREFERRED 12"		UNDER STORM FORCE 12"		UNDER RECLAIM 12"		UNDER SANITARY GRAVITY 12"		UNDER SANITARY FORCE 12"	
STORM FORCE		OVER WATER 12"		OVER STORM GRAVITY 6"		OVER RECLAIM 12"		OVER SANITARY GRAVITY 12"		OVER SANITARY FORCE 12"	
		UNDER STORM GRAVITY 12"		UNDER STORM GRAVITY 6"		UNDER RECLAIM 12"		UNDER SANITARY GRAVITY 12"		UNDER SANITARY FORCE 12"	
RECLAIM		OVER WATER 12"		OVER STORM GRAVITY 12"		OVER STORM FORCE 12"		OVER SANITARY GRAVITY 12"		OVER SANITARY FORCE 12"	
		UNDER WATER 12"		UNDER STORM GRAVITY 6", PREFERRED 12"		UNDER STORM FORCE 12"		UNDER SANITARY GRAVITY 12"		UNDER SANITARY FORCE 12"	
SANITARY GRAVITY		OVER WATER 12"		OVER STORM GRAVITY 12"		OVER RECLAIM 12"		OVER SANITARY GRAVITY 12"		OVER SANITARY FORCE 12"	
		UNDER WATER 6", PREFERRED 12"		UNDER STORM GRAVITY 6", PREFERRED 12"		UNDER STORM FORCE 12"		UNDER SANITARY GRAVITY 12"		UNDER SANITARY FORCE 12"	
SANITARY FORCE		OVER WATER 12"		OVER STORM GRAVITY 12"		OVER RECLAIM 12"		OVER SANITARY GRAVITY 12"		OVER SANITARY FORCE 12"	
		UNDER WATER 12"		UNDER STORM GRAVITY 6", PREFERRED 12"		UNDER STORM FORCE 12"		UNDER SANITARY GRAVITY 12"		UNDER SANITARY FORCE 12"	

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CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL
PLANNING
TRANSPORTATION

NO.	DATE	BY	REVISIONS
1	04/20/05	JD	80% DESIGN PLANS
2	06/02/05	JD	

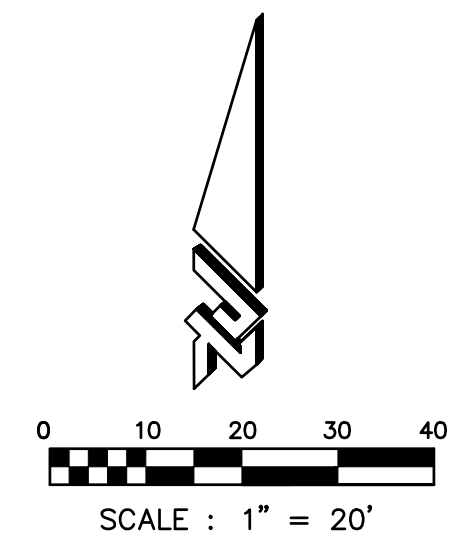
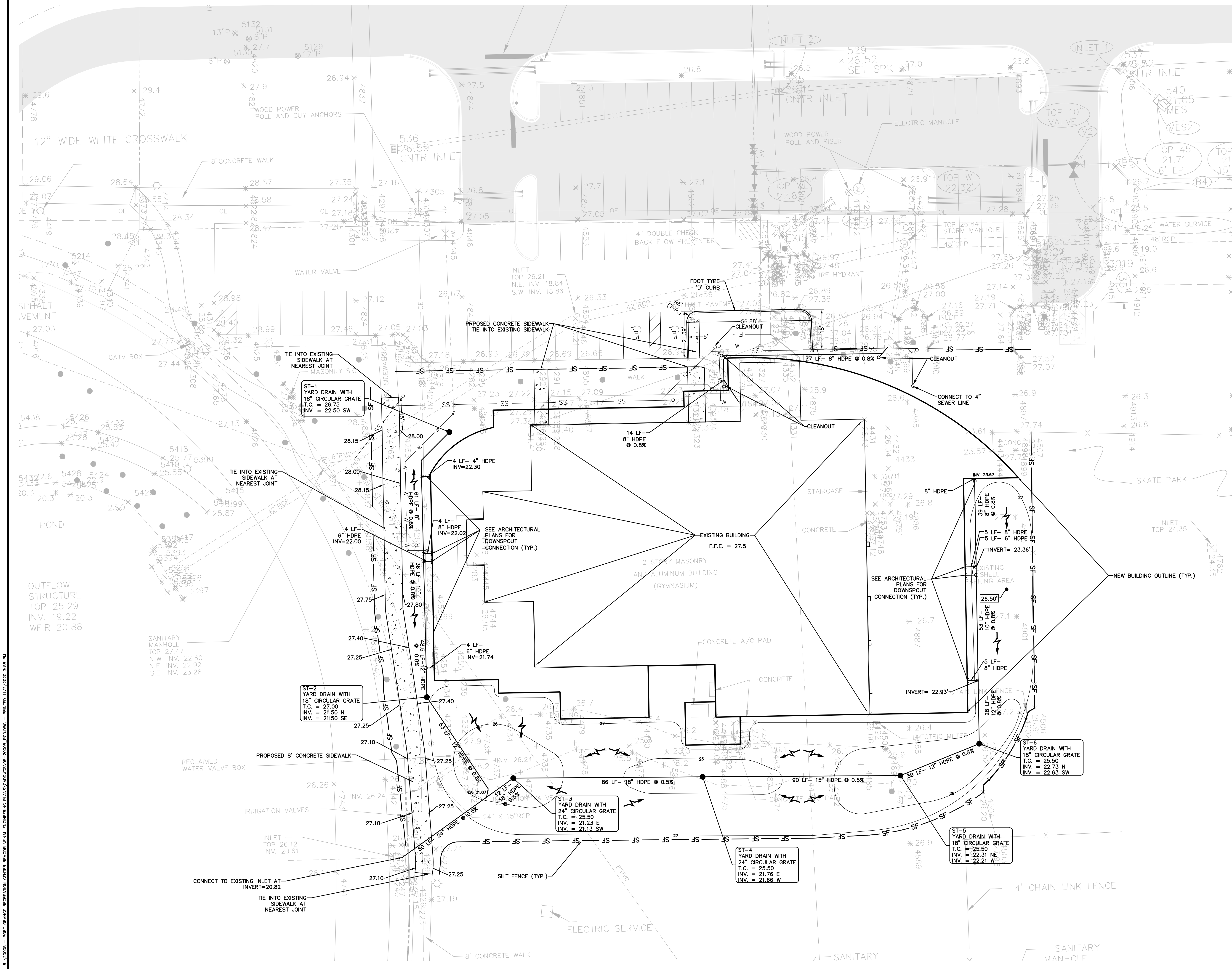
**PORT ORANGE RECREATION
CENTER REMODEL
FINAL ENGINEERING PLANS
DEMOLITION & EROSION
CONTROL PLAN**

PROJECT NO.: ZC 20005
DESIGNED BY: JD
DRAFTED BY: TR
CHECKED BY: JD
DRAWING FILE: 04-20005_ECP XREFS: 20005BAS.DWG XREFS: 20005BAS.DWG XREFS: 20005BAS.DWG
JOHN A. DILLARD, JR., P.E. NO. 37256 NOT VALID WITHOUT SEAL
SHEET: C4 OF 7

**CONTRACTOR REQUIREMENTS FOR SITE CLEARING, GRADING,
AND EROSION CONTROL DESIGN AND CONSTRUCTION NOTES:**

- THE FOLLOWING MEASURES REPRESENT MINIMUM STANDARDS TO BE ADHERED TO BY THE CONTRACTOR THROUGHOUT THE CONSTRUCTION OF A PROJECT. THE CITY RESERVES THE RIGHT TO REQUIRE ADDITIONAL MEASURES TO BE EMPLOYED WHEN WARRANTED BY EXTREME CONDITIONS AND/OR THE FAILURE OF THE CONTRACTOR TO EMPLOY THE APPROPRIATE EROSION CONTROL BEST MANAGEMENT PRACTICES. FAILURE TO COMPLY WITH THESE PROVISIONS SHALL RESULT IN THE ISSUANCE OF A "STOP WORK ORDER".
- NO DISTURBANCE OF PROPOSED CONSERVATION EASEMENTS, NATURAL BUFFERS, OR WATER BODIES IS PERMITTED. THE CONTRACTOR SHALL LOCATE THESE AREAS ON SITE AND BARRICADE THEM TO AVOID ANY UNAUTHORIZED CLEARING, BARRICADES AND OTHER PROTECTIVE FENCING ARE TO BE LOCATED AT THE DRIP LINE OF EXISTING NATIVE TREES OR AT THE EDGE OF THE NATIVE UNDER- STORY HABITAT, WHICHEVER IS NEAREST TO THE CONSTRUCTION ACTIVITY.
- SPECIMEN AND HISTORIC TREES, CONSERVATION EASEMENTS, NATURAL VEGETATION BUFFERS, AND SIMILAR AREAS MUST BE PROTECTED BY THE CONTRACTOR FROM FURTHER CLEARING OR REMOVAL. BARRICADES, IN LIEU OF THE DRIP LINE OF THE TREES AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. BARBED WIRE IS NOT PERMITTED AS A PROTECTIVE BARRIER.
 - WHERE A CHANGE OF GRADE OCCURS AT THE DRIP LINE OF A SPECIMEN TREE, SILT FENCES WILL BE REQUIRED DURING CONSTRUCTION AND RETAINING WALLS MUST BE INSTALLED PRIOR TO FINAL ACCEPTANCE BY THE CITY.
 - IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL PROTECTIVE VEGETATION, BARRICADES AND EROSION CONTROL STRUCTURES AND MEASURES IN PLACE PRIOR TO THE COMMENCEMENT OF ANY EARTHWORK, INCLUDING PRELIMINARY GRUBBING. THESE MEASURES INCLUDE, BUT ARE NOT LIMITED TO, TEMPORARY CONSTRUCTION FENCES, SYNTHETIC JUTE BALES, WATTLES, &/OR HAVE BEST MANAGEMENT PRACTICES (BMP'S) AS REQUIRED, SILT FENCES, AND FLOATING TURBIDITY BARRIERS. FURTHER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL EROSION CONTROL DEVICES THROUGHOUT THE DURATION OF THE ENTIRE PROJECT. MAINTENANCE SHALL INCLUDE PERIODIC INSPECTION AND REMOVAL OF DEBRIS ABUTTING EROSION CONTROL DEVICES AS SPECIFICALLY IDENTIFIED IN CHAPTER 10, ARTICLE I, SECTION 5 OF THE LAND DEVELOPMENT CODE.
 - PRIOR TO THE INSTALLATION OF ANY FILL MATERIALS ON SUBJECT SITE, SILT FENCES SHALL BE INSTALLED (1) ALONG SUBJECT SITE BOUNDARY AND PROPERTY LINES, (2) AT THE EDGE OF CONSERVATION EASEMENTS AND WETLANDS, (3) ADJACENT TO NATURAL LANDSCAPE BUFFERS, (4) AROUND THE PERIMETER OF EXISTING STORM WATER TREATMENT FACILITIES, AND (5) AT ANY ADDITIONAL AREAS THAT THE CITY DEEMS NECESSARY TO BE PROTECTED FROM POTENTIAL EROSION IMPACTS DURING CONSTRUCTION. THESE CONDITIONS SHALL APPLY IN ALL INSTANCES WHERE FILL MATERIAL IS BEING INSTALLED WITHIN 25 FEET OF ANY OF THE AFOREMENTIONED LOCATIONS. WHILE THESE ITEMS REPRESENT THE MINIMUM REQUIREMENTS, THE CITY RESERVES THE RIGHT TO IMPOSE ADDITIONAL PROTECTIVE MEASURES, AS DETERMINED DURING ACTUAL SITE VISITS CONDUCTED AS PART OF THE STANDARD REVIEW OF THE SITE-SPECIFIC ABC CLEARING PERMIT APPLICATION AND THROUGHOUT PROJECT CONSTRUCTION.
 - WHERE FILL MATERIAL IS INTENDED TO BE INSTALLED ADJACENT TO EXISTING VEGETATION WHICH IS INTENDED TO REMAIN NATURAL, THE CONTRACTOR SHALL INSTALL A TREE PROTECTION FENCING MEASURE, IN LIEU OF INSTALLING EITHER WOOD BRACING OR ORANGE MESH FENCING. THIS PRACTICE IS ENCOURAGED BY THE CITY. IF THE SILT FENCE FAILS TO PROVIDE ADEQUATE PROTECTION FROM IMPACT DUE TO CONSTRUCTION, THEN ADDITIONAL CONSTRUCTION FENCING OR WOOD BRACING SHALL BE REQUIRED.
 - AT A MINIMUM, THE CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED AREAS. SUFFICIENT GRASS COVERAGE IS TO BE ESTABLISHED WITHIN TWO WEEKS.
 - IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR THROUGH SCHEDULING, TO MINIMIZE THE DISTURBANCE OF SITE AREAS THAT HAVE BEEN BROUGHT TO THEIR PROPOSED FINAL GRADE WITHIN SEVEN (7) DAYS OF BRINGING A SUBJECT AREA TO ITS FINAL GRADE OR INACTIVITY IN CONSTRUCTION. THE CONTRACTOR SHALL INSTALL SEED AND MULCH OR SOD, AS REQUIRED.
 - FOR INDIVIDUAL CONSTRUCTION PROJECTS INVOLVING MULTIPLE PHASES, (PHASING IS REQUIRED FOR SITES 30 ACRES OR LARGER) UPON COMPLETION OF EACH PHASE OF THE PROJECT, SEEDING AND MULCHING AND / OR SODDING IS TO BE PERFORMED PRIOR TO COMMENCING THE NEXT PHASE OF CONSTRUCTION.
 - ONCE AN AREA IS SEED OR SODDED, IT MUST BE MAINTAINED BY THE CONTRACTOR TO ALLOW THE GRASS TO BECOME ESTABLISHED. IF THE GRASS IS NOT ESTABLISHED WITHIN TWO WEEKS THE CITY MAY REQUIRE THE CONTRACTOR TO RE-SEED OR A NON-VEGETATIVE OPTION MAY BE EMPLOYED.
 - ANY BURNING OF CLEARED MATERIALS MUST BE INSPECTED AND PERMITTED ON A DAILY BASIS. CONTACT THE FIRE MARSHALL AT 756-5401 PRIOR TO EACH DAY OF DESIRED BURNING.
 - ABSOLUTELY NO BURYING OF CLEARED MATERIALS IS PERMITTED.
 - THE REMOVAL OF ALL VEGETATION AND TOPSOIL ON THE FUTURE ROADWAY, PARKING AND BUILDING LOT AREAS IS REQUIRED TO BE COMPLETED PRIOR TO THE PLACEMENT OF FILL ON THOSE AREAS. THE TOPSOIL MAY BE TEMPORARILY STOCKPILED AND USED AS TOPSOIL OVER CONSTRUCTION GREEN AREAS SUCH AS PLANT BEDS, SODDED AREAS, AND WHERE TREES ARE TO BE INSTALLED OR RELOCATED.
 - A SIGNED, DATED, AND SEALED LETTER FROM A SOILS ENGINEER OR THE ENGINEER OF RECORD CERTIFYING THAT THE AREAS TO BE FILLED HAVE BEEN STRIPPED OF ORGANIC MATERIALS, MUST BE SUBMITTED TO THE CITY PRIOR TO FILLING.
 - FILL MATERIAL IS TO BE PLACED IN ONE FOOT LIFTS AND COMPACTED TO THE APPROPRIATE DENSITY (98% FOR PAVED AREAS AND 95% FOR BUILDING PADS AND ALL OTHER AREAS AS PER AASHTO T-180).
 - DURING SUBDIVISION DEVELOPMENT WHEN FUTURE BUILDING LOTS ARE FILLED AS PART OF THE OVERALL SUBDIVISION IMPROVEMENTS, COMPACTION TEST REPORTS MUST BE PERFORMED ON THE BUILDING LOTS AT 300 FOOT INTERVALS. THESE TESTS ARE TO BE PERFORMED IN ONE-FOOT VERTICAL INCREMENTS. THE RESULTS OF THESE TESTS ARE TO BE SUBMITTED TO THE CITY UPON COMPLETION OF THE TESTS.
 - IF ANY MUCK MATERIAL IS DISCOVERED, IT SHALL BE REQUIRED TO BE REMOVED AND REPLACED WITH A SUITABLE MATERIAL THAT IS PROPERLY BACKFILLED, COMPACTED AND TESTED USING AASHTO T-180 MODIFIED PROCTOR METHOD.
 - STOCKPILING IS NOT GENERALLY PERMITTED BY THE CITY. WHEN ALLOWED, STOCKPILES SHALL NOT EXCEED SIX FEET IN HEIGHT MEASURED FROM THE ORIGINAL GRADE. AT A MINIMUM, STOCK PILES THAT WILL REMAIN IN PLACE IN EXCESS OF TWENTY DAYS SHOULD BE SEED AND MULCHED IMMEDIATELY UPON PLACEMENT OF THE FINAL LIFT.
 - SOILS ARE TO BE STABILIZED BY WATER OR OTHER MEANS DURING CONSTRUCTION. THIS IS INTENDED TO REDUCE SOIL EROSION AND THE IMPACT TO NEIGHBORING COMMUNITIES. ADEQUATE WATERING METHODS SHOULD BE EMPLOYED TO ALLOW DAILY COVERAGE OF THE ENTIRE LIMITS OF ALL AREAS THAT DO NOT HAVE AN ESTABLISHED VEGETATIVE COVER. METHODS TO BE EMPLOYED INCLUDE, BUT ARE NOT LIMITED TO, WATER TRUCKS, PERMANENT IRRIGATION SYSTEMS, TEMPORARY SPRINKLER SYSTEMS OPERATED BY PUMPING UNITS CONNECTED TO WET RETENTION PONDS, WATER CANNONS, TEMPORARY IRRIGATION SYSTEMS MOUNTED ATOP STOCKPILE AREAS, AND OTHER METHODS AS DEEMED NECESSARY BY THE CITY.
 - ALL FILL MATERIALS LOCATED BENEATH STRUCTURES AND PAVEMENT SHALL CONSIST OF CLEAN GRANULAR SAND FREE FROM ORGANICS AND SIMILAR MATERIAL THAT COULD DECOMPOSE.
 - ALL FILL TO BE PLACED IN LANDSCAPED AREAS SHALL HAVE A PH RANGE BETWEEN 5.5 AND 7.5, BE ORGANIC IN NATURE, FREE OF ROCKS AND DEBRIS, OR MATCH NATIVE EXISTING SOILS.

11/2/2005 - PORT ORANGE RECREATION CENTER REMODEL FINAL ENGINEERING PLANS (CADD) - 2005 - PGD.DWG - PRINTED: 11/2/2005 3:58 PM



- LEGEND:**
- PROPOSED CONSERVATION EASEMENT
 - EXISTING ASPHALT PAVEMENT
 - PROPOSED CONCRETE
 - PROPOSED STORMWATER INLET
 - PROPOSED STORMWATER MANHOLE
 - PROPOSED MES
 - PROPOSED YARD DRAIN
 - PROPOSED GRADE
 - PROPOSED MATCH EXISTING GRADE LABEL
 - EXISTING GRADE LABEL
 - PROPOSED FINISHED FLOOR ELEVATION
 - PROPOSED FLOW DIRECTION
 - EXISTING STREET LIGHT



CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL
PLANNING
TRANSPORTATION

NO.	DATE	BY	REVISIONS
1	05-05-05	JD	80% DESIGN PLANS
2	05-05-05	JD	

**PORT ORANGE RECREATION
CENTER REMODEL
FINAL ENGINEERING PLANS
PAVING, GRADING &
DRAINAGE PLAN**

PROJECT NO.: ZC 20005
DESIGNED BY: JD
DRAFTED BY: TR
CHECKED BY: JD

DRAWING FILE: 05-20005_PGD
XREFS: 2005BAS.DWG
XREFS: -



CIVIL ENGINEERING
 LANDSCAPE ARCHITECTURE
 ENVIRONMENTAL
 PLANNING
 TRANSPORTATION

[illegible]

PORT ORANGE RECREATION CENTER REMODEL FINAL ENGINEERING PLANS UTILITY PLAN

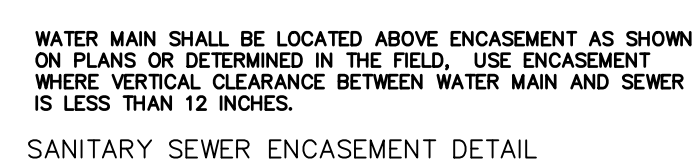
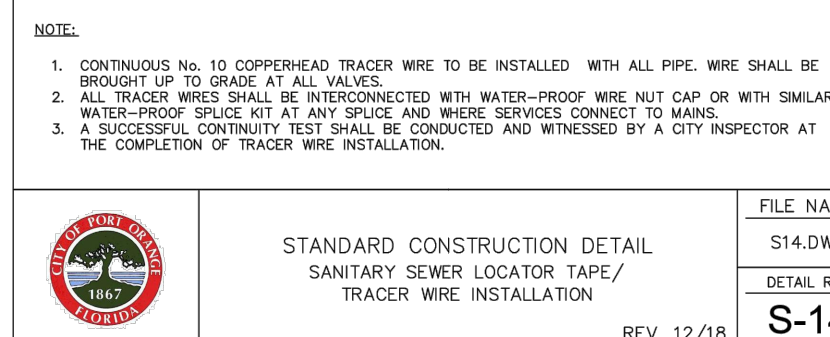
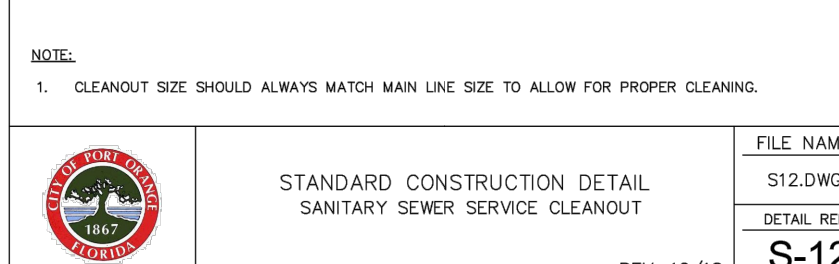
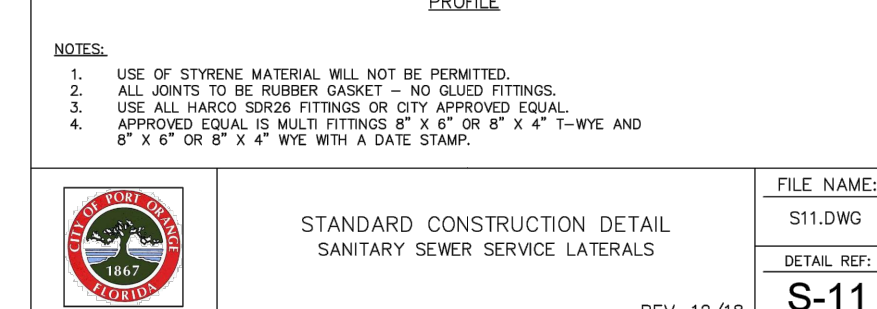
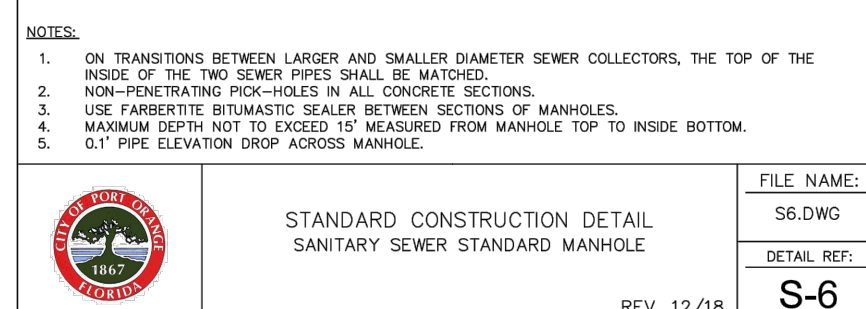
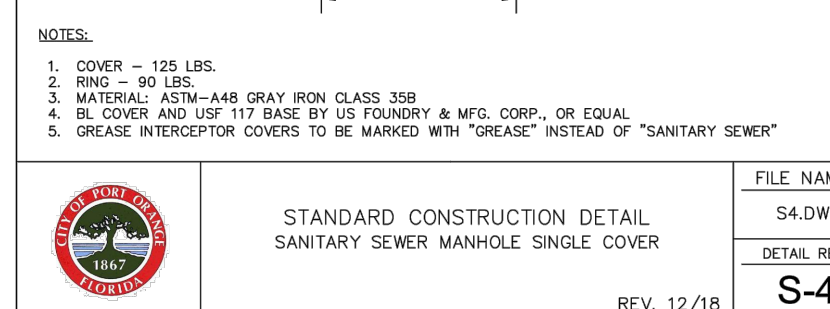
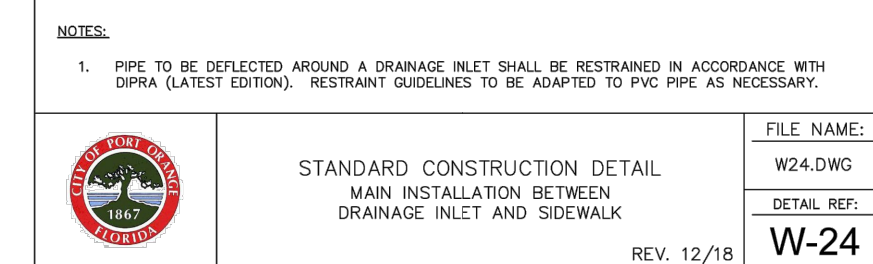
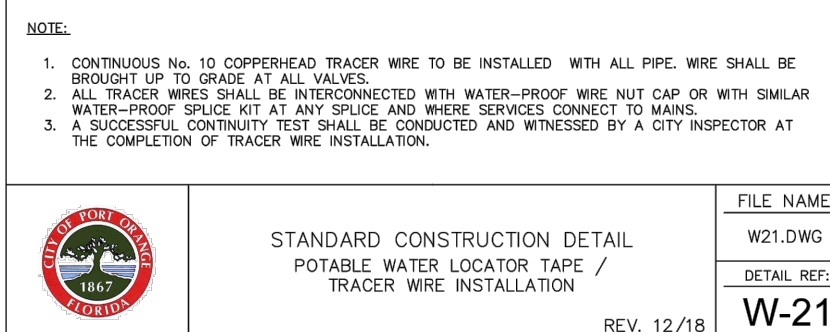
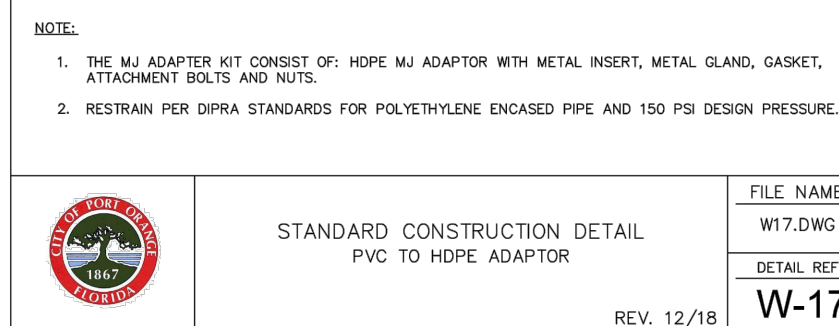
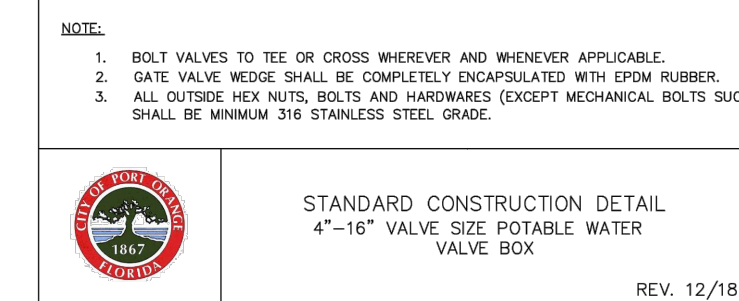
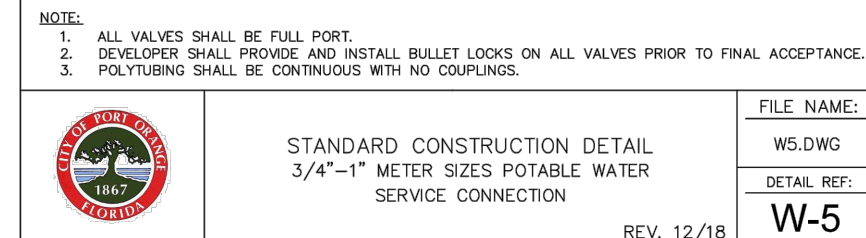
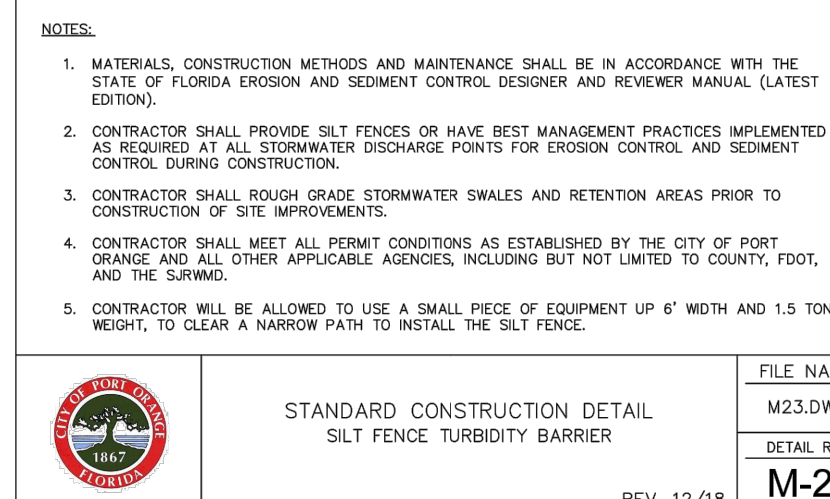
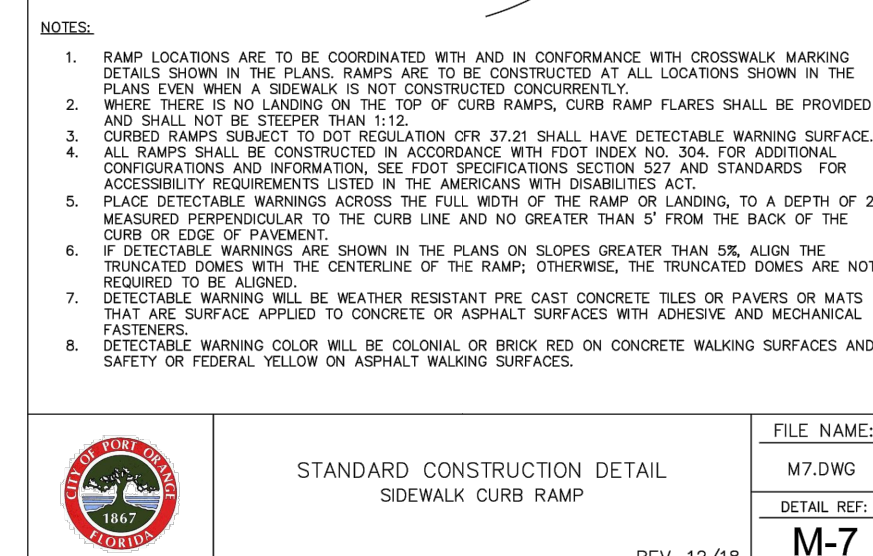
VOLUSIA COUNTY, FLORIDA

CITY OF PORT ORANGE

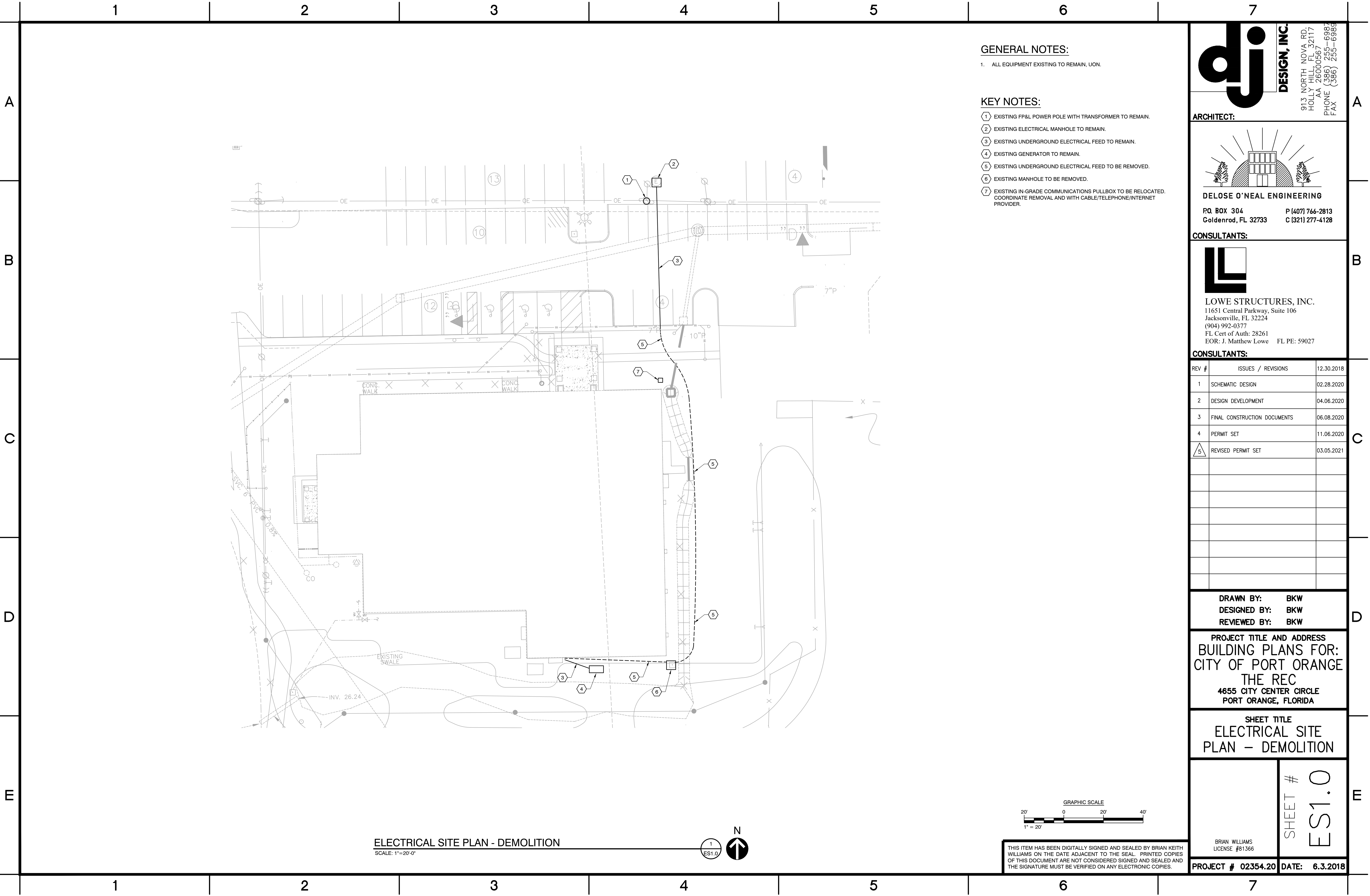
PROJECT NO: ZC 20005
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DRAFTED BY: TR
CHECKED BY: JD
DRAWING FILE: 06-20005_UTL XREF'S: 20005BAS.DWG XREF'S: -

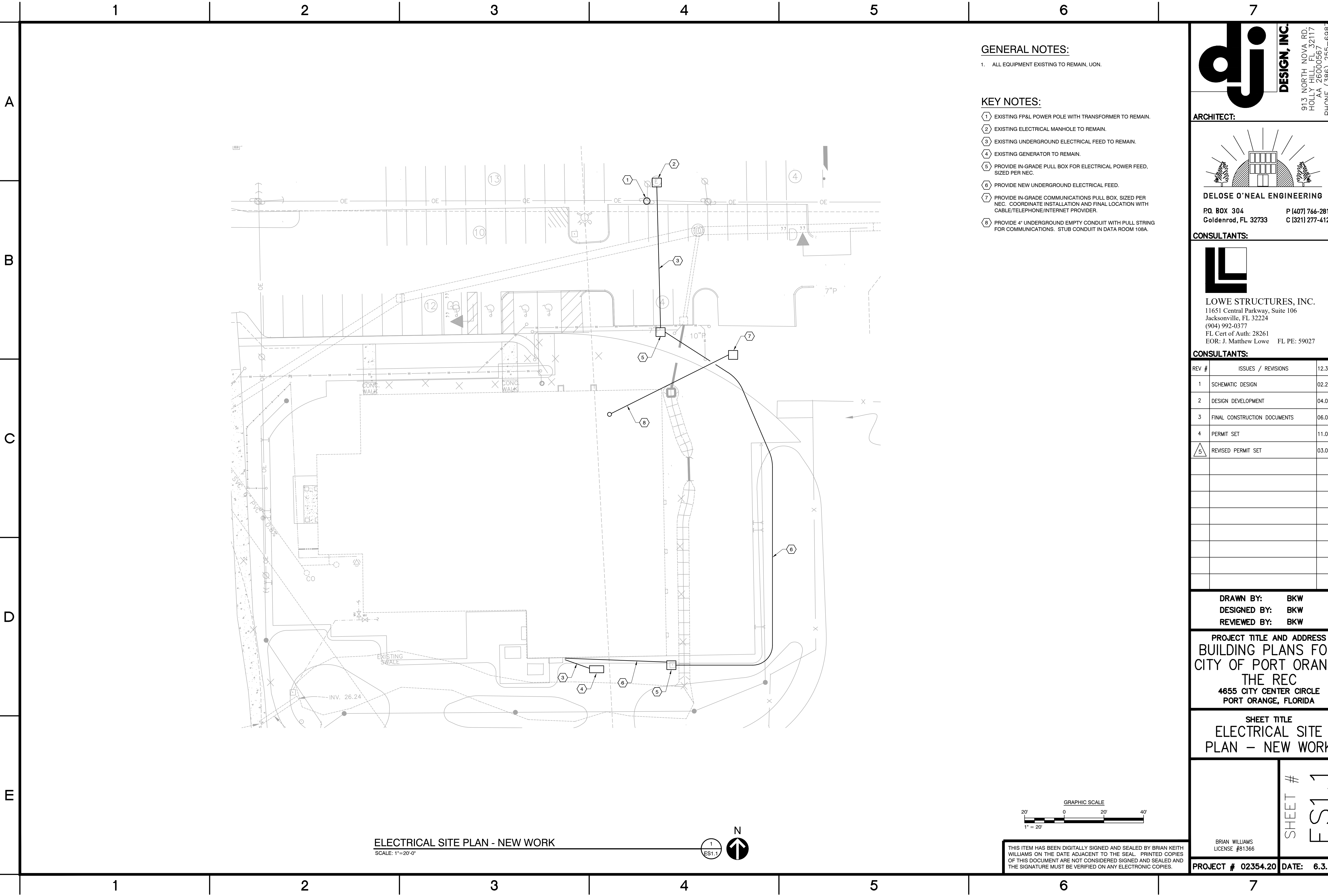
JOHN A. DILLARD, JR., P.E., NO. 37256
NOT VALID WITHOUT SEAL

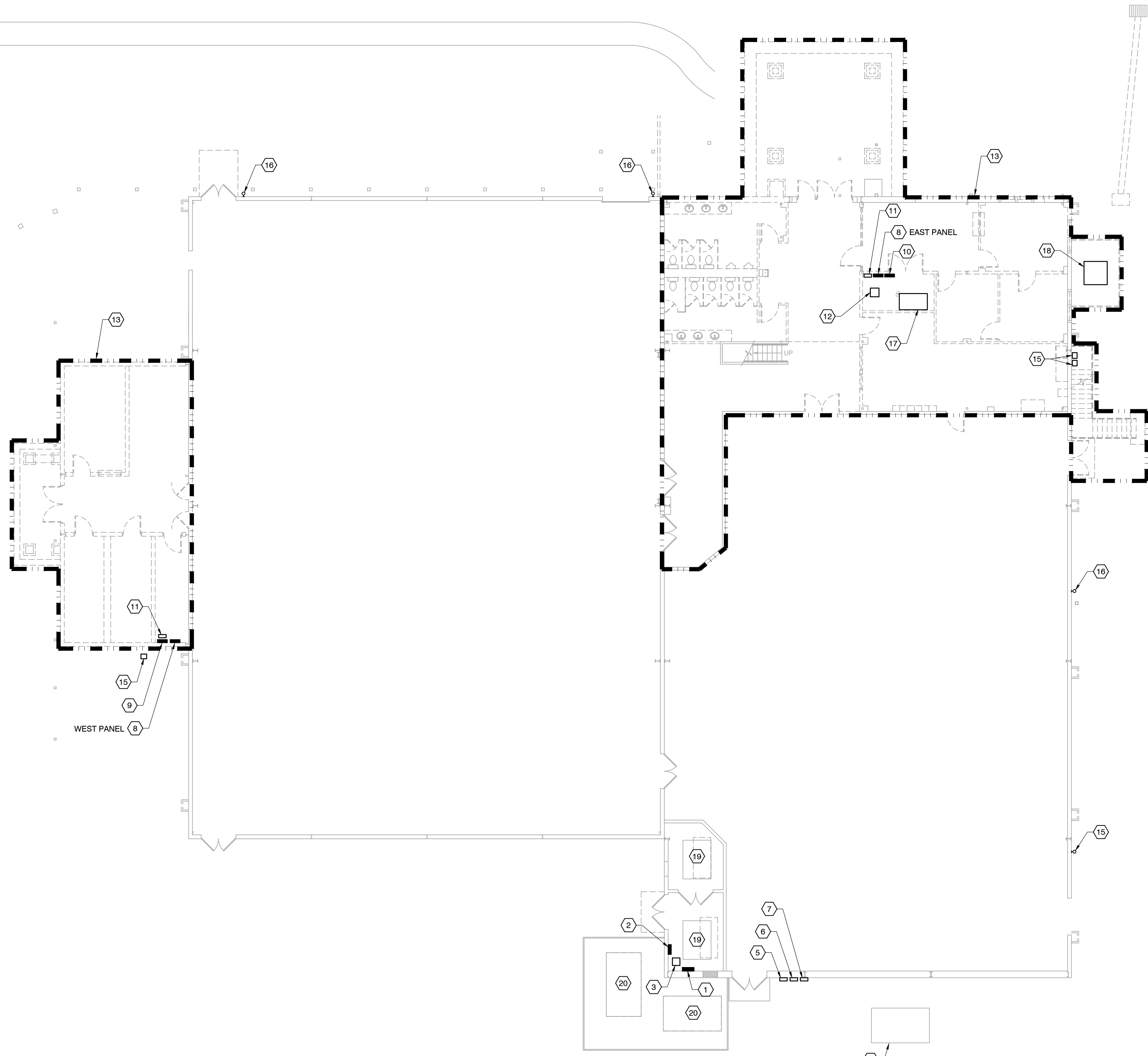
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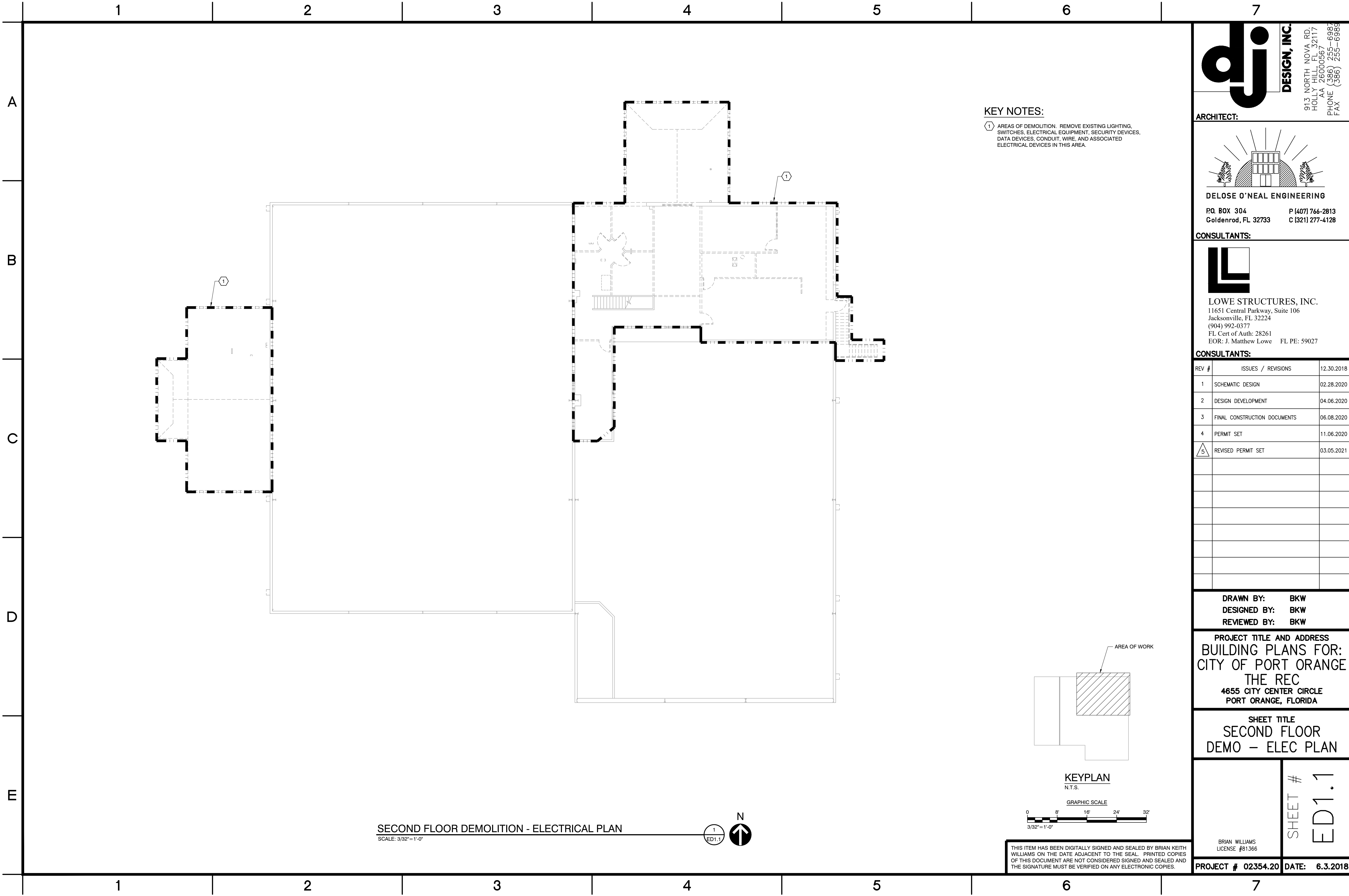


LAST REVISION 01/17	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	CURB AND GUTTER INDEX 520-001	SHEET 1 of 2
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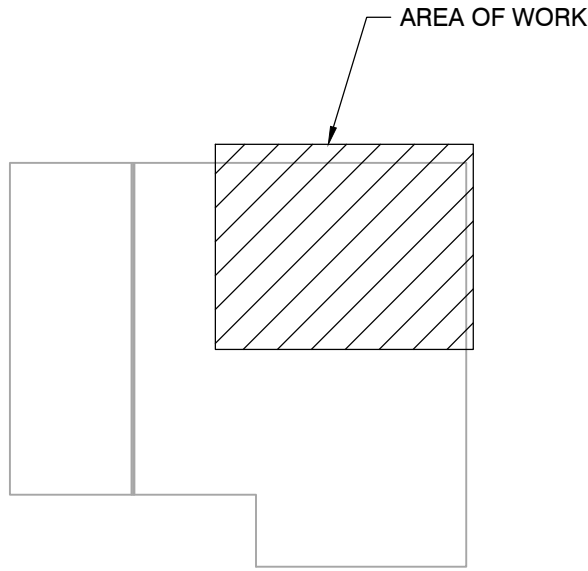




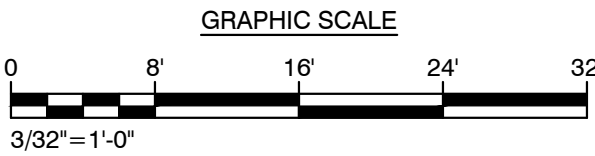




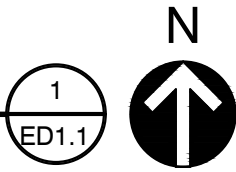
KEY NOTES:
① AREAS OF DEMOLITION. REMOVE EXISTING LIGHTING, SWITCHES, ELECTRICAL EQUIPMENT, SECURITY DEVICES, DATA DEVICES, CONDUIT, WIRE, AND ASSOCIATED ELECTRICAL DEVICES IN THIS AREA.



KEYPLAN
N.T.S.

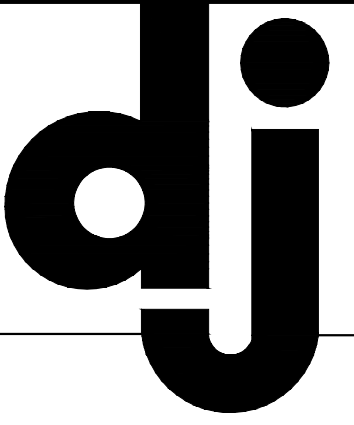


SECOND FLOOR DEMOLITION - ELECTRICAL PLAN
SCALE: 3/32"=1'-0"



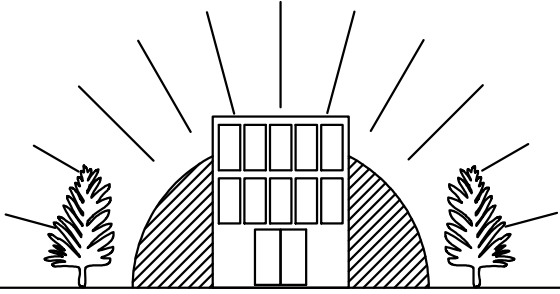
1
ED1.1

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HOLLY HILL, FL 32117
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FAX (386) 255-6989

ARCHITECT:

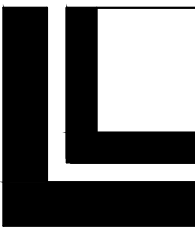


DELOSE O'NEAL ENGINEERING

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Goldenrod, FL 32733

P (407) 766-2813
C (321) 277-4128

CONSULTANTS:



LOWE STRUCTURES, INC.

11651 Central Parkway, Suite 106
Jacksonville, FL 32224
(904) 992-0377
FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

REV #	ISSUES / REVISIONS	12.30.2018
1	SCHEMATIC DESIGN	02.28.2020
2	DESIGN DEVELOPMENT	04.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	06.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	03.05.2021

DRAWN BY: BKW
DESIGNED BY: BKW
REVIEWED BY: BKW

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
SECOND FLOOR
DEMO - ELEC PLAN

BRIAN WILLIAMS
LICENSE #81366

SHEET #
ED1.1

PROJECT # 02354.20 DATE: 6.3.2018

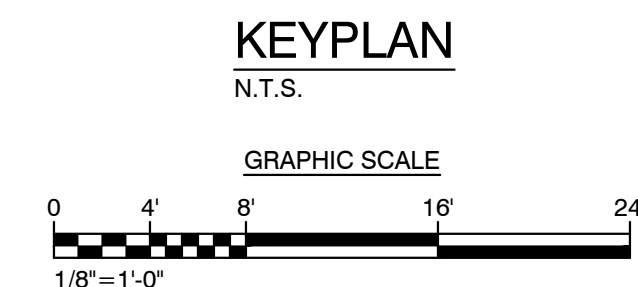
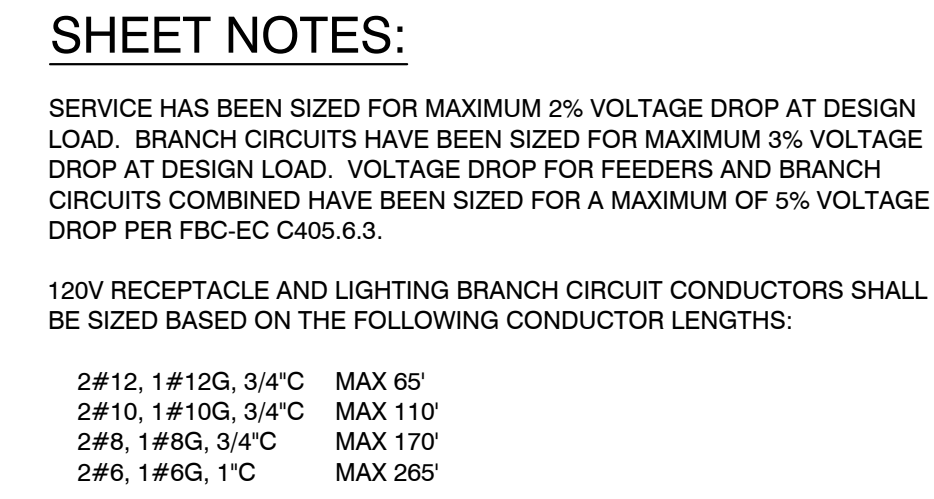


SCALE: 1/8"=1'-0"

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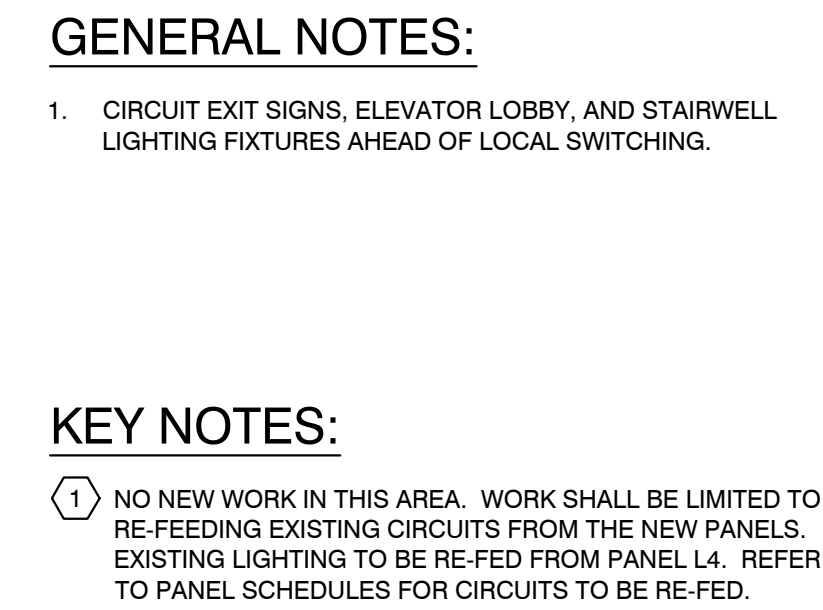
DATE: 6.3.2018





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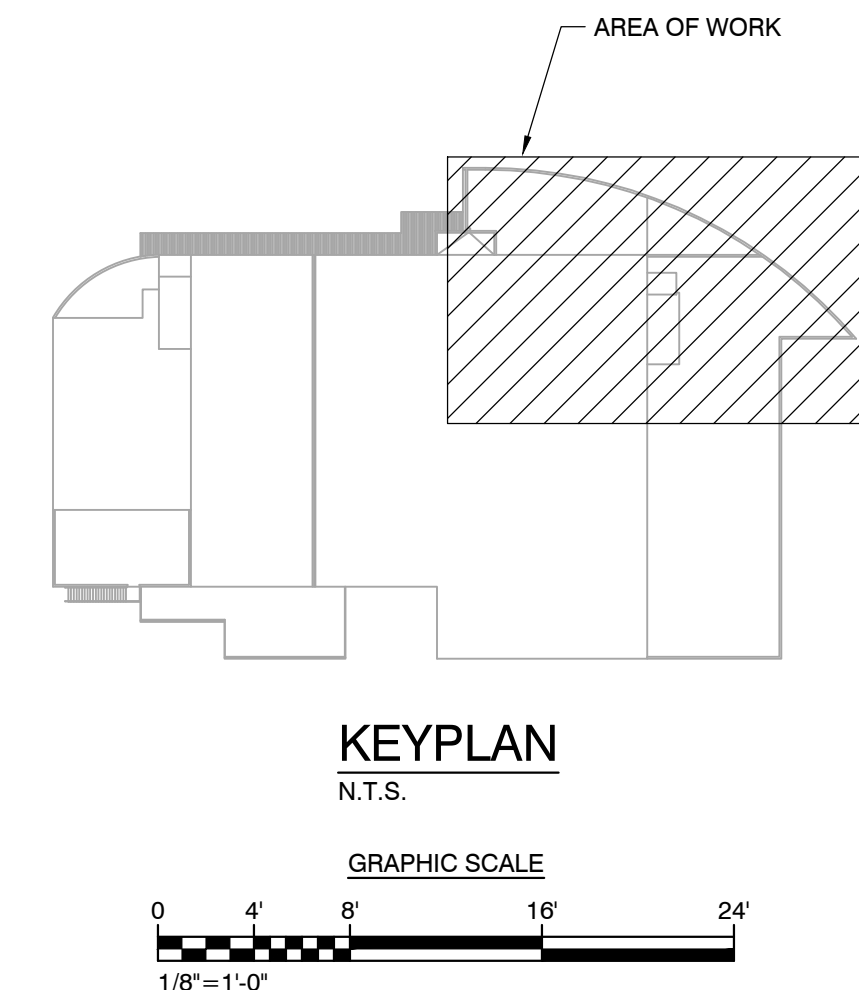


SHEET NOTES:

SERVICE HAS BEEN SIZED FOR MAXIMUM 2% VOLTAGE DROP AT DESIGN LOAD. BRANCH CIRCUITS HAVE BEEN SIZED FOR MAXIMUM 3% VOLTAGE DROP AT DESIGN LOAD. VOLTAGE DROP FOR FEEDERS AND BRANCH CIRCUITS COMBINED HAVE BEEN SIZED FOR A MAXIMUM OF 5% VOLTAGE DROP PER FBC-EC C405.6.3.

120V RECEPTACLE AND LIGHTING BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED BASED ON THE FOLLOWING CONDUCTOR LENGTHS:

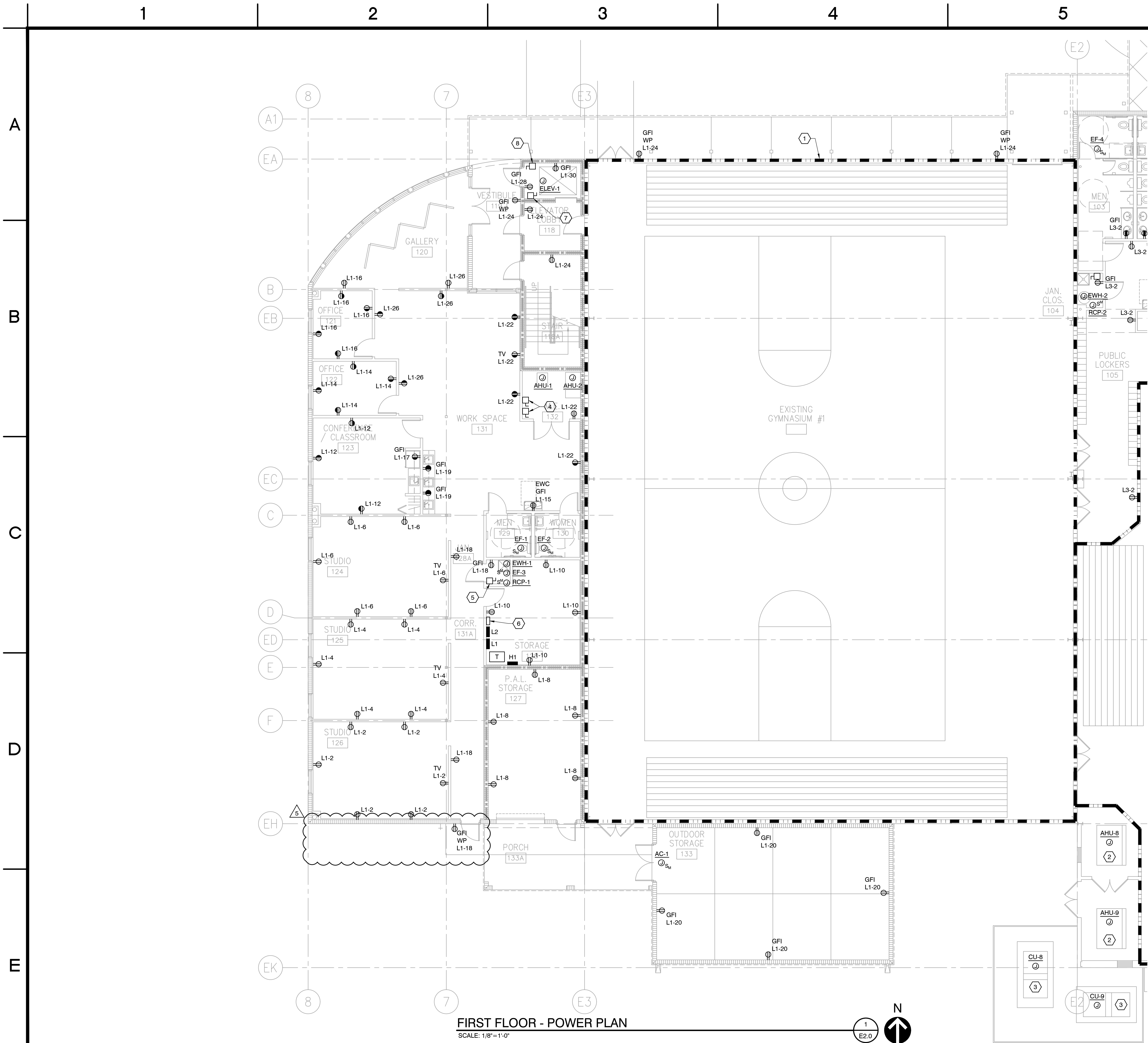
2#12, 1#12G, 3/4"	MAX 65'
2#10, 1#10G, 3/4"	MAX 110'
2#8, 1#8G, 3/4"	MAX 170'
2#6, 1#6G, 1"	MAX 265'



SECOND FLOOR - LIGHTING PLAN

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[illegible]



GENERAL NOTES:

1. REFER TO EQUIPMENT CONNECTION SCHEDULE ON SHEET E7.0 FOR ADDITIONAL INFORMATION.

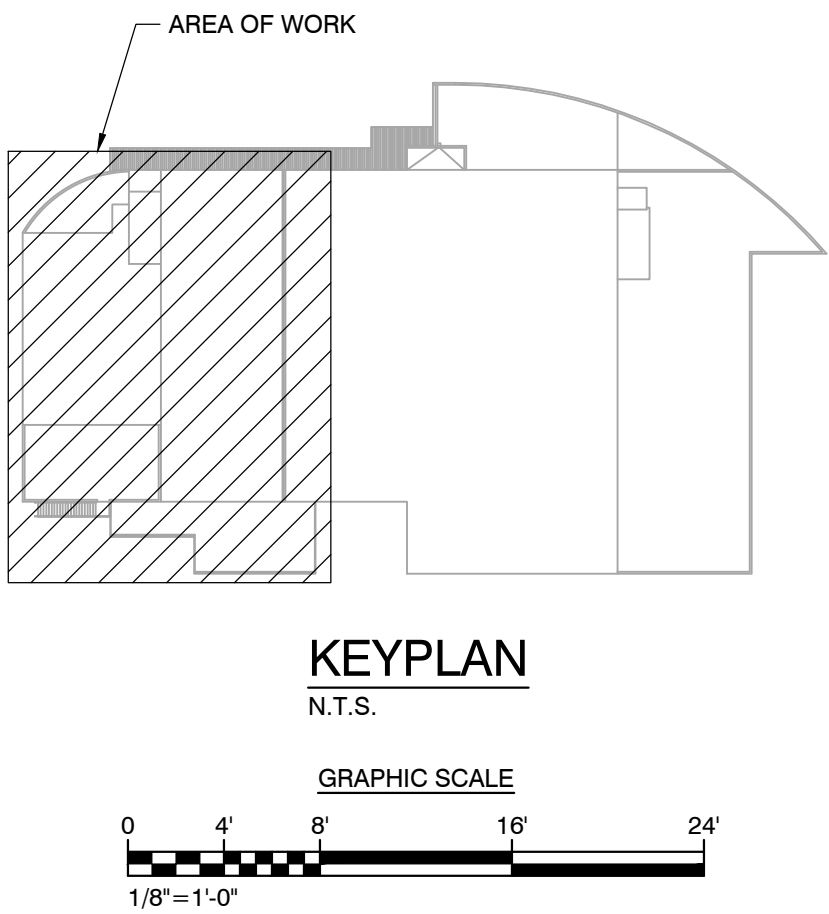
- KEY NOTES:**
- 1 NO NEW WORK IN THIS AREA. WORK SHALL BE LIMITED TO RE-FEEDING EXISTING CIRCUITS FROM THE NEW PANELS.
 - 2 BID ALTERNATIVE: EXISTING AIR HANDLING UNIT, FED FROM MDP, TO BE REMOVED AND REPLACED.
 - 3 BID ALTERNATIVE: EXISTING CONDENSING UNIT, FED FROM MDP, TO BE REMOVED AND REPLACED.
 - 4 PROVIDE DISCONNECT SWITCH FOR AIR HANDLING UNIT.
 - 5 PROVIDE DISCONNECT SWITCH FOR ELECTRIC WATER HEATER.
 - 6 NEW LOCATION OF LIGHTING CONTACTOR FEEDING GYMNASIUM LIGHTING.
 - 7 PROVIDE DISCONNECT SWITCH WITH SHUNT TRIP AND FIRE ALARM RELAY FOR ELEVATOR POWER.
 - 8 PROVIDE DISCONNECT SWITCH FOR ELEVATOR CAB LIGHTING AND RECEPTACLES.

SHEET NOTES:

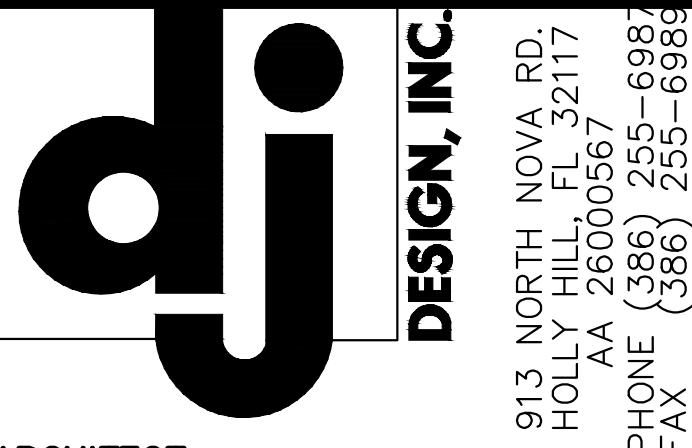
SERVICE HAS BEEN SIZED FOR MAXIMUM 2% VOLTAGE DROP AT DESIGN LOAD. BRANCH CIRCUITS HAVE BEEN SIZED FOR MAXIMUM 3% VOLTAGE DROP AT DESIGN LOAD. VOLTAGE DROP FOR FEEDERS AND BRANCH CIRCUITS COMBINED HAVE BEEN SIZED FOR A MAXIMUM OF 5% VOLTAGE DROP PER FBC-EC C405.6.3.

120V RECEPTACLE AND LIGHTING BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED BASED ON THE FOLLOWING CONDUCTOR LENGTHS:

2#12, 1#12G, 3/4" C	MAX 65'
2#10, 1#10G, 3/4" C	MAX 110'
2#8, 1#8G, 3/4" C	MAX 170'
2#6, 1#6G, 1" C	MAX 265'



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FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

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2	DESIGN DEVELOPMENT	04.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	06.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	03.05.2021

DRAWN BY: BKW
DESIGNED BY: BKW
REVIEWED BY: BKW

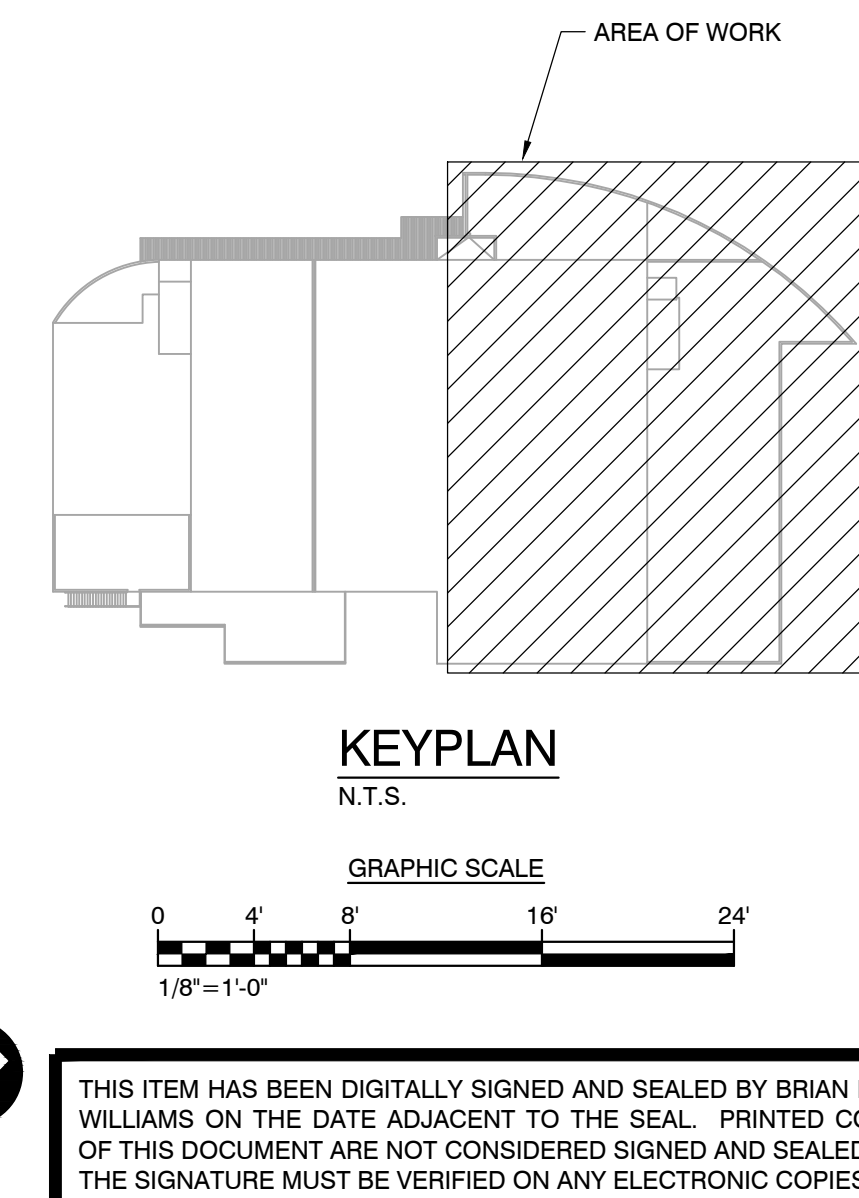
PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
FIRST FLOOR -
POWER PLAN

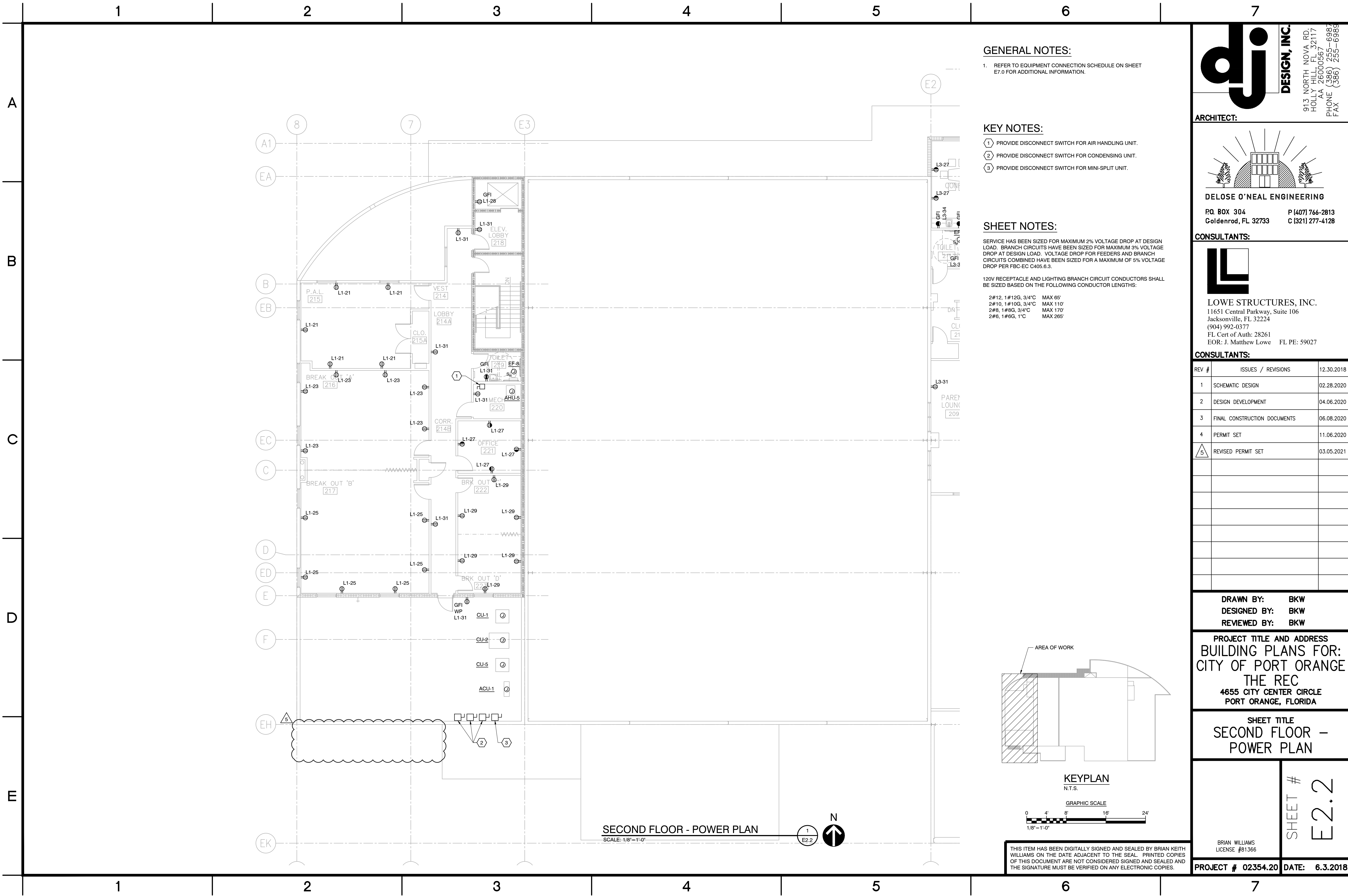
BRIAN WILLIAMS
LICENSE #81366

SHEET #
E2.0

PROJECT # 02354.20 **DATE: 6.3.2018**



BRIAN WILLIAMS LICENSE #81366	SHEET # E2.1
PROJECT # 02354.20	DATE: 6.3.2018



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AA 26000567
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ARCHITECT:

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DRAWN BY: BKW
DESIGNED BY: BKW
REVIEWED BY: BKW

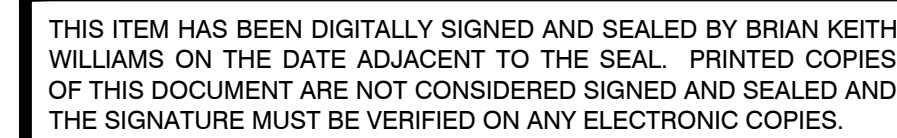
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BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

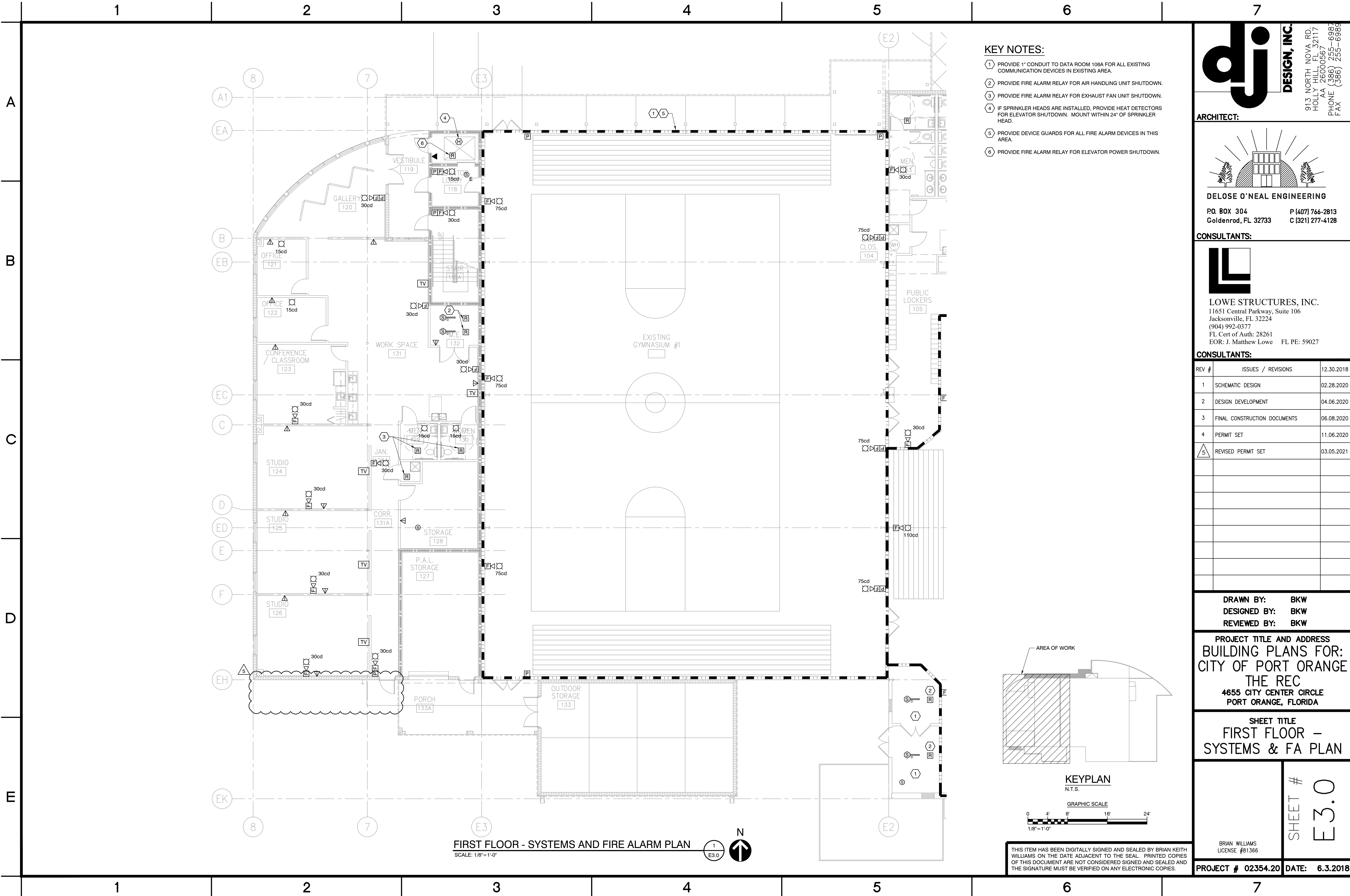
SHEET TITLE
SECOND FLOOR -
POWER PLAN

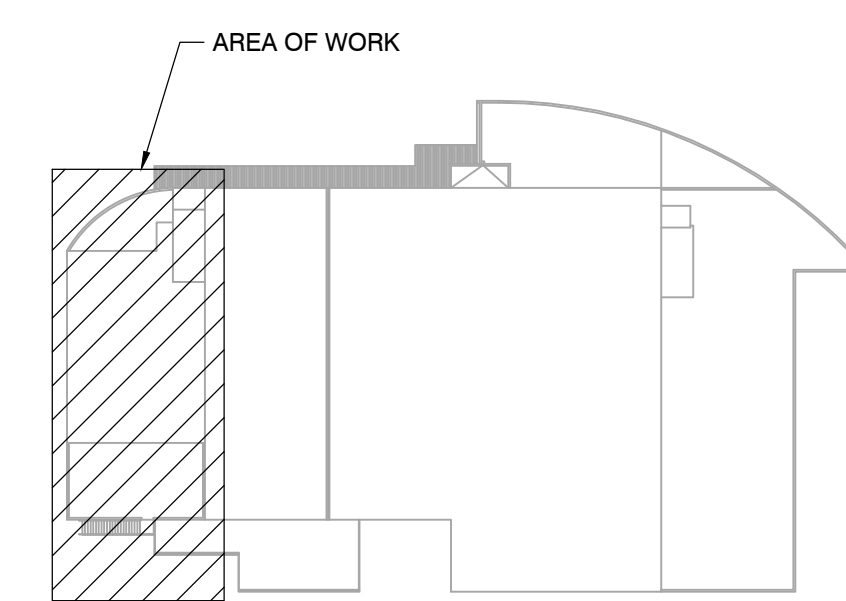
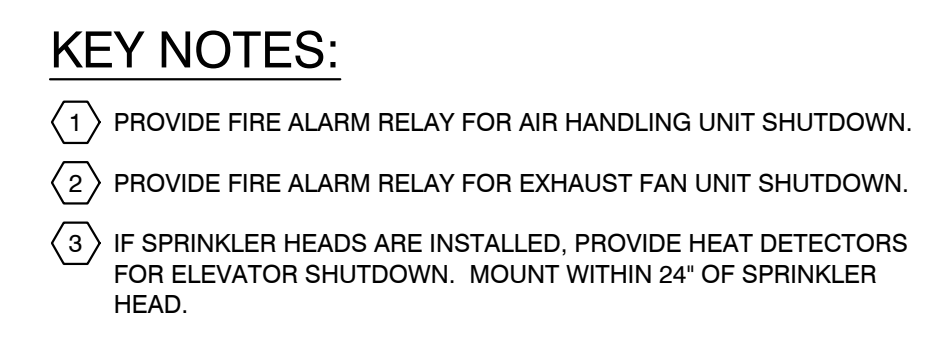
BRIAN WILLIAMS
LICENSE #81366

SHEET #
E2.2

PROJECT # 02354.20 **DATE: 6.3.2018**

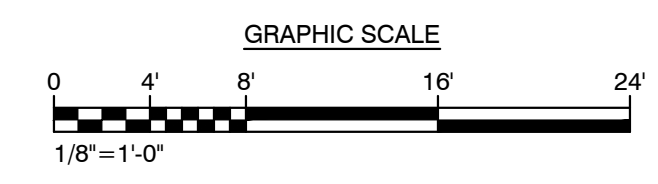
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KEYPLAN
N.T.S.

GRAPHIC SCALE

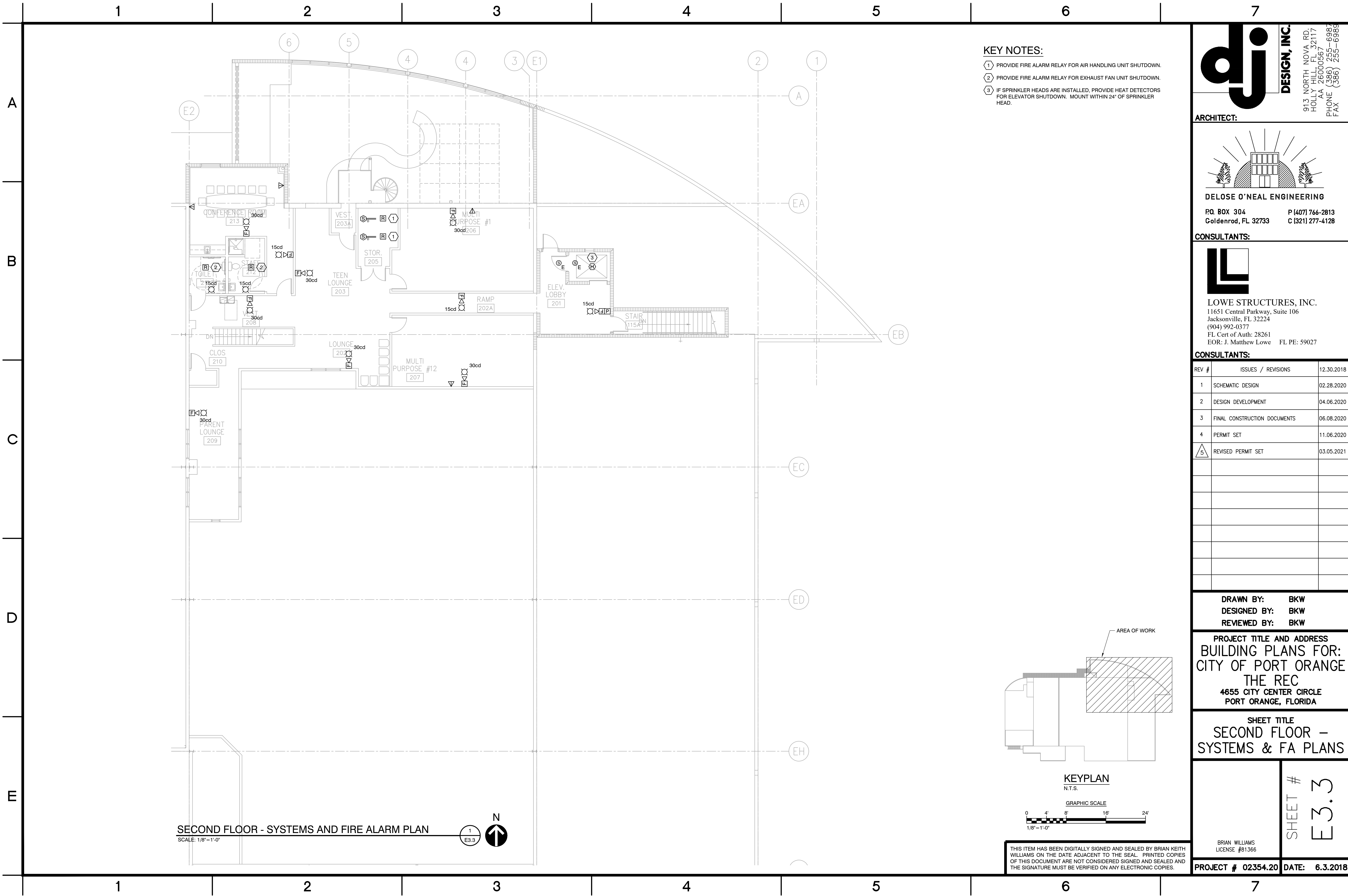


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SECOND FLOOR - SYSTEMS AND FIRE ALARM PLAN



dj DESIGN, INC.		
ARCHITECT:		
 DELOSE O'NEAL ENGINEERING P.O. BOX 304 P (407) 766-2813 Goldsboro, NC 27333 C (321) 277-4128		
CONSULTANTS:		
L Lowe Structures, Inc. 11651 Central Parkway, Suite 106 Jacksonville, FL 32224 (904) 992-0377 FL Cert of Auth: 28261 EOR: J. Matthew Lowe FL PE: 59027		
CONSULTANTS:		
REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	02.28.2020
2	DESIGN DEVELOPMENT	04.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	06.08.2020
4	PERMIT SET	11.06.2020
S	REVISED PERMIT SET	03.05.2021
DRAWN BY: BKW DESIGNED BY: BKW REVIEWED BY: BKW		
PROJECT TITLE AND ADDRESS BUILDING PLANS FOR: CITY OF PORT ORANGE THE REC 4655 CITY CENTER CIRCLE PORT ORANGE, FLORIDA		
SHEET TITLE SECOND FLOOR – SYSTEMS & FA PLAN		
BRIAN WILLIAMS LICENSE #81366	SHEET # E3.2	
PROJECT # 02354.20 DATE: 6.3.2018		



- KEY NOTES:**
- 1 PROVIDE FIRE ALARM RELAY FOR AIR HANDLING UNIT SHUTDOWN.
 - 2 PROVIDE FIRE ALARM RELAY FOR EXHAUST FAN UNIT SHUTDOWN.
 - 3 IF SPRINKLER HEADS ARE INSTALLED, PROVIDE HEAT DETECTORS FOR ELEVATOR SHUTDOWN. MOUNT WITHIN 24" OF SPRINKLER HEAD.

DESIGN, INC.

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AA 26000567
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FAX (386) 255-6989

ARCHITECT:

DELOSE O'NEAL ENGINEERING

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CONSULTANTS:

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DRAWN BY: BKW

DESIGNED BY: BKW

REVIEWED BY: BKW

PROJECT TITLE AND ADDRESS

BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC

4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE

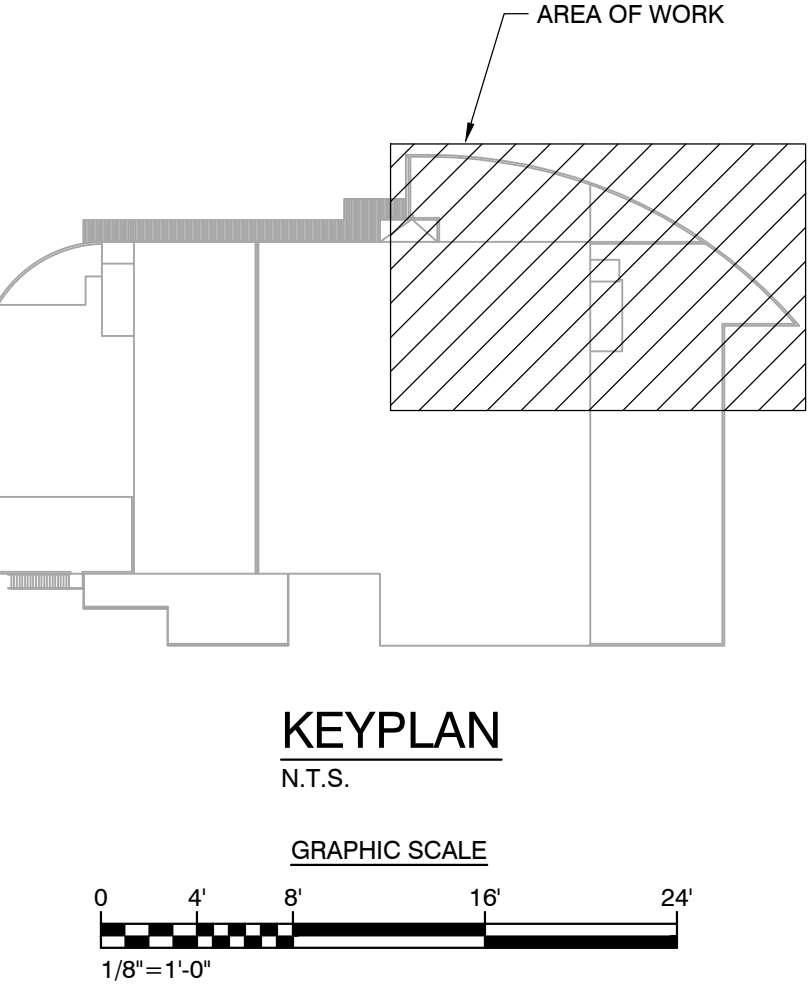
SECOND FLOOR –
SYSTEMS & FA PLANS

BRIAN WILLIAMS
LICENSE #81366

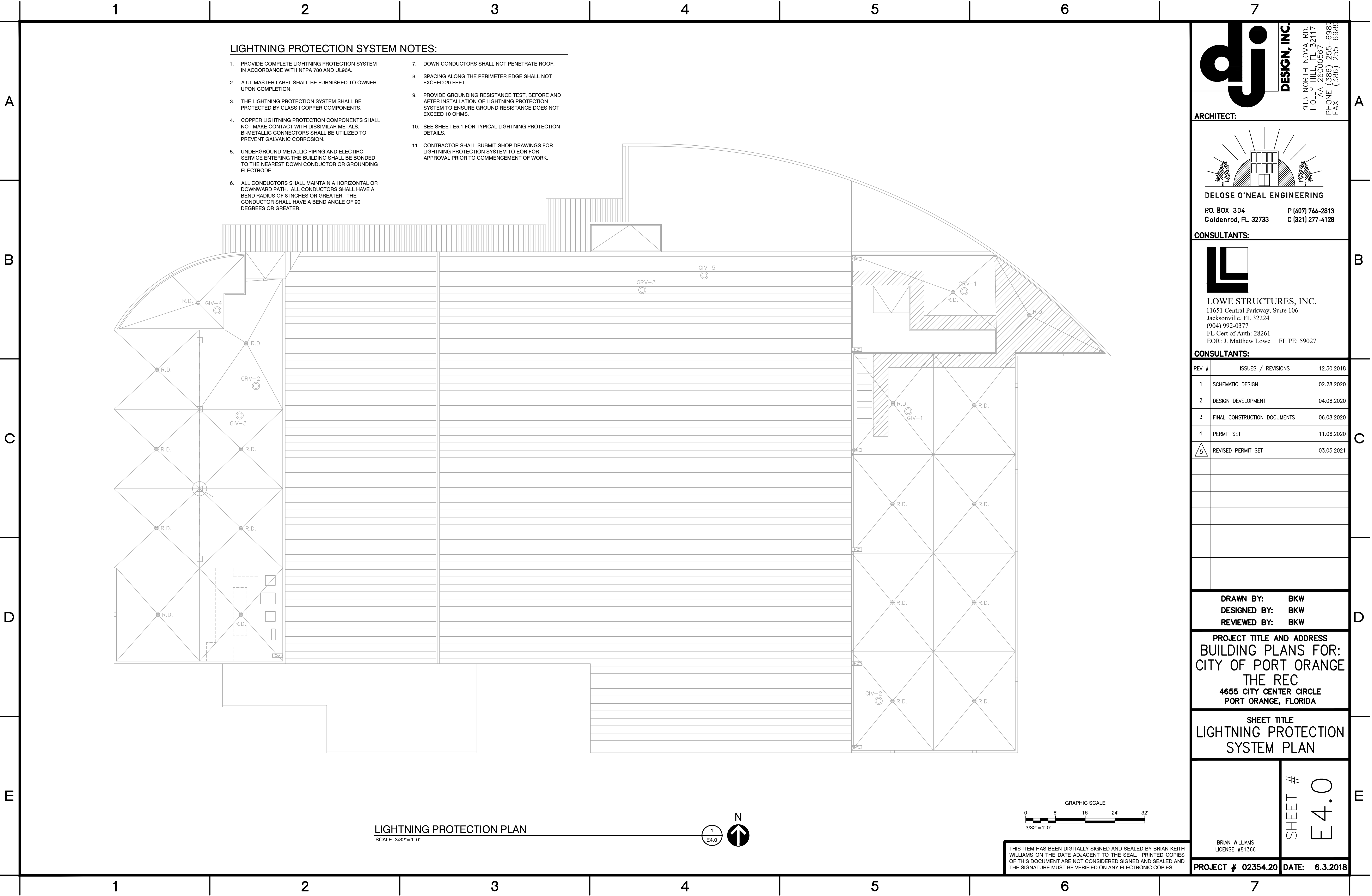
SHEET #
E3.3

PROJECT # 02354.20

DATE: 6.3.2018



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LIGHTNING PROTECTION SYSTEM NOTES:

1. PROVIDE COMPLETE LIGHTNING PROTECTION SYSTEM IN ACCORDANCE WITH NFPA 780 AND UL96A.

2. A UL MASTER LABEL SHALL BE FURNISHED TO OWNER UPON COMPLETION.

3. THE LIGHTNING PROTECTION SYSTEM SHALL BE PROTECTED BY CLASS I COPPER COMPONENTS.

4. COPPER LIGHTNING PROTECTION COMPONENTS SHALL NOT MAKE CONTACT WITH DISSIMILAR METALS. BI-METALLIC CONNECTORS SHALL BE UTILIZED TO PREVENT GALVANIC CORROSION.

5. UNDERGROUND METALLIC PIPING AND ELECTIRC SERVICE ENTERING THE BUILDING SHALL BE BONDED TO THE NEAREST DOWN CONDUCTOR OR GROUNDING ELECTRODE.

6. ALL CONDUCTORS SHALL MAINTAIN A HORIZONTAL OR DOWNWARD PATH. ALL CONDUCTORS SHALL HAVE A BEND RADIUS OF 8 INCHES OR GREATER. THE CONDUCTOR SHALL HAVE A BEND ANGLE OF 90 DEGREES OR GREATER.
7. DOWN CONDUCTORS SHALL NOT PENETRATE ROOF.

8. SPACING ALONG THE PERIMETER EDGE SHALL NOT EXCEED 20 FEET.

9. PROVIDE GROUNDING RESISTANCE TEST, BEFORE AND AFTER INSTALLATION OF LIGHTNING PROTECTION SYSTEM TO ENSURE GROUND RESISTANCE DOES NOT EXCEED 10 OHMS.

10. SEE SHEET E5.1 FOR TYPICAL LIGHTNING PROTECTION DETAILS.

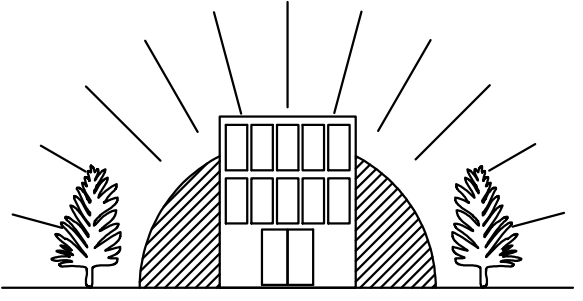
11. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR LIGHTNING PROTECTION SYSTEM TO EOR FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK.

dj

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ARCHITECT:



DEROSE O'NEAL ENGINEERING
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Goldenrod, FL 32733 C (321) 277-4128

CONSULTANTS:



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11651 Central Parkway, Suite 106
Jacksonville, FL 32224
(904) 992-0377
FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

REV #	ISSUES / REVISIONS	12.30.2018
1	SCHEMATIC DESIGN	02.28.2020
2	DESIGN DEVELOPMENT	04.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	06.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	03.05.2021

DRAWN BY: BKW

DESIGNED BY: BKW

REVIEWED BY: BKW

PROJECT TITLE AND ADDRESS

**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE

**LIGHTNING PROTECTION
SYSTEM PLAN**

BRIAN WILLIAMS
LICENSE #81366

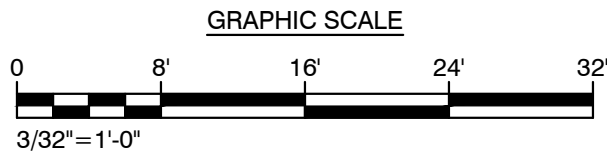
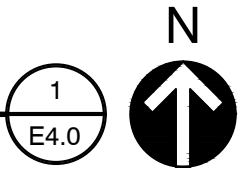
SHEET #

E4.0

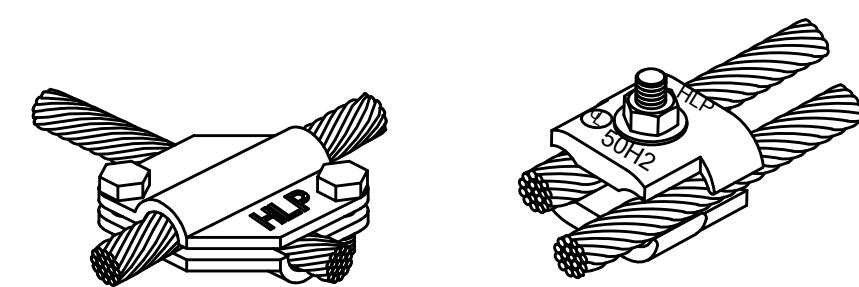
PROJECT # 02354.20

DATE: 6.3.2018

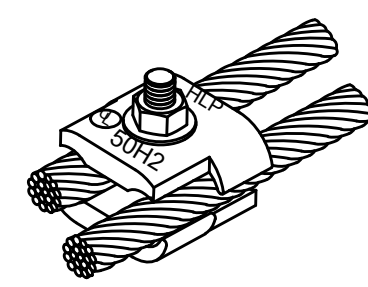
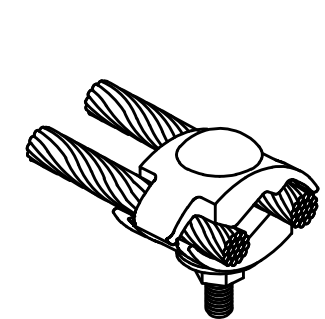
LIGHTNING PROTECTION PLAN
SCALE: 3/32"=1'-0"



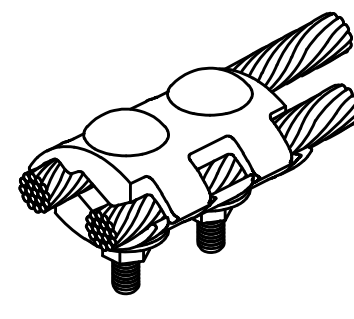
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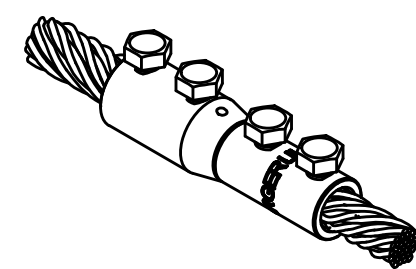
No. 210 Style Cross Run
Connector

No. B1BC Style Parallel
Connector

No. 208, Style Bonding
Connector



No. 204 Style Parallel
Connector

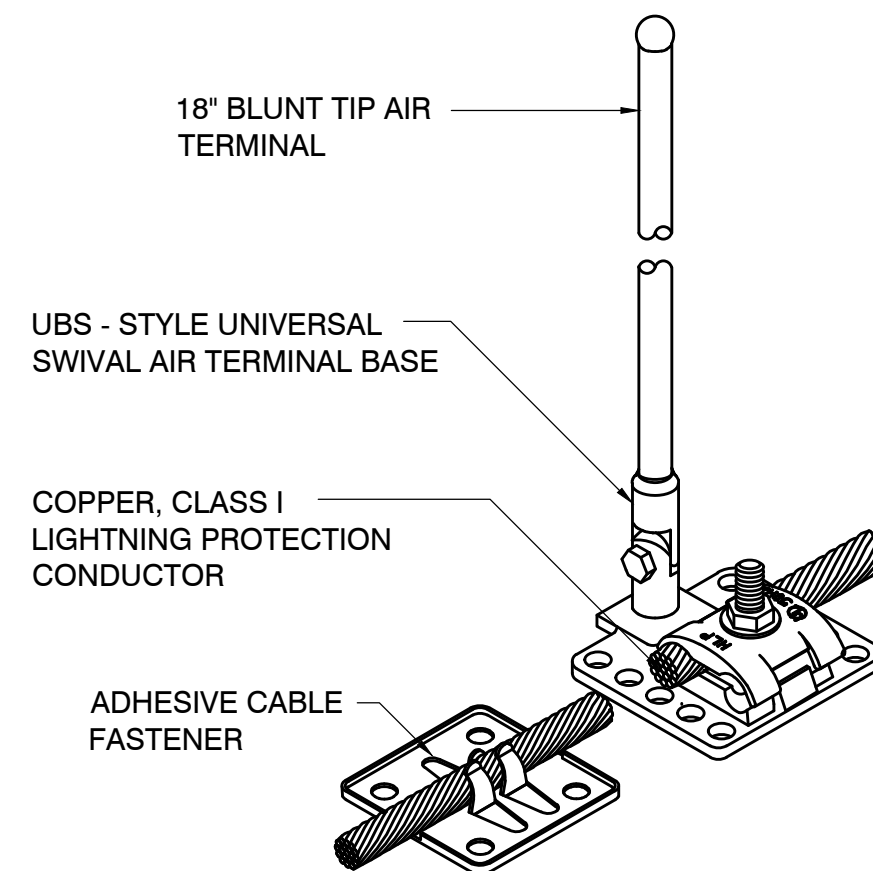


No. 211, Bi-Metal Connector

TYPICAL CABLE CONNECTORS

SCALE: NTS

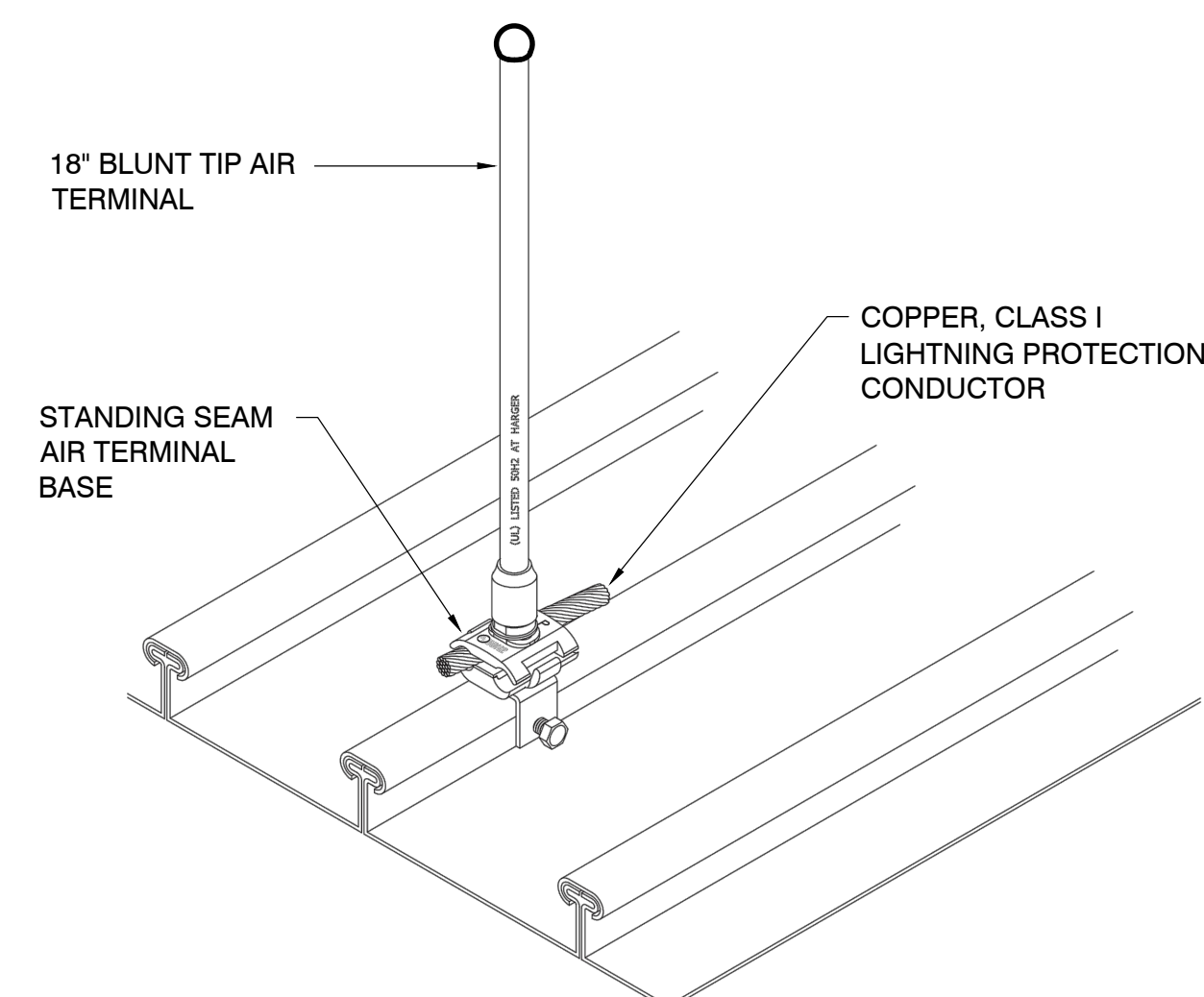
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E5.1



AIR TERMINAL BASE

SCALE: NTS

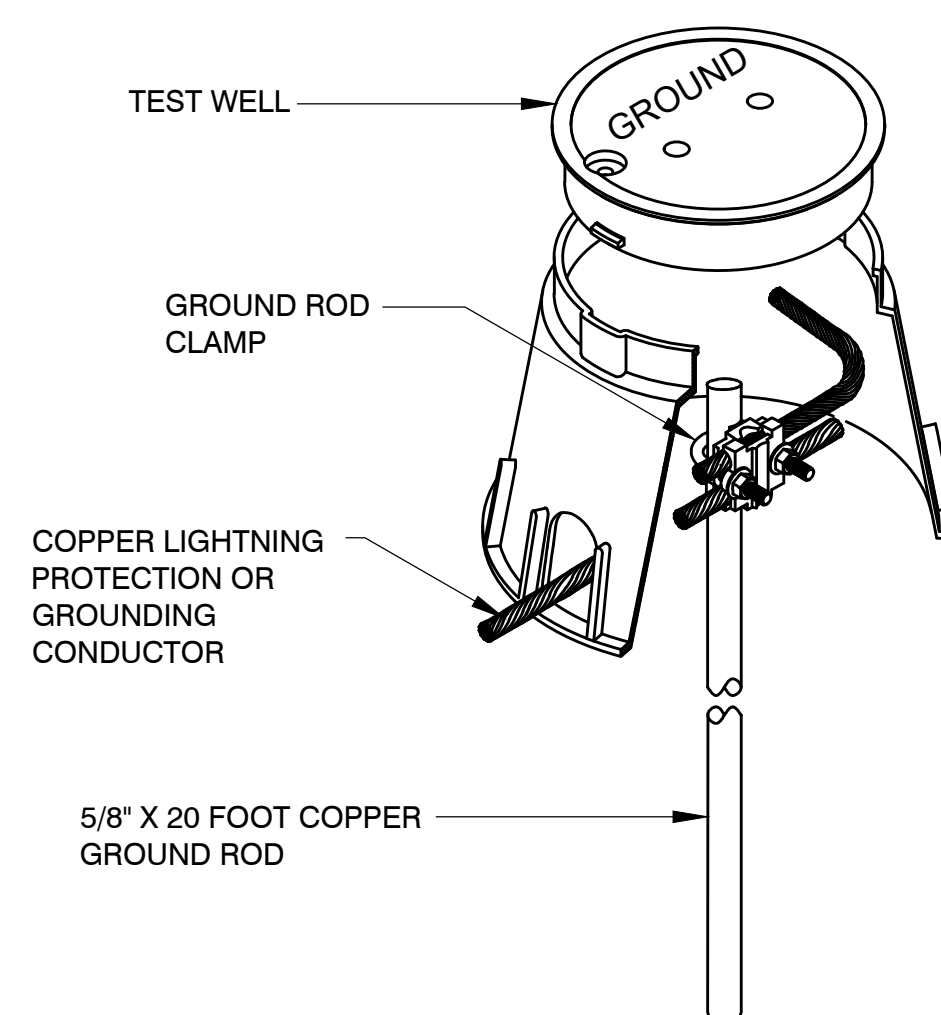
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E5.1



STANDING SEAM AIR TERMINAL BASE

SCALE: NTS

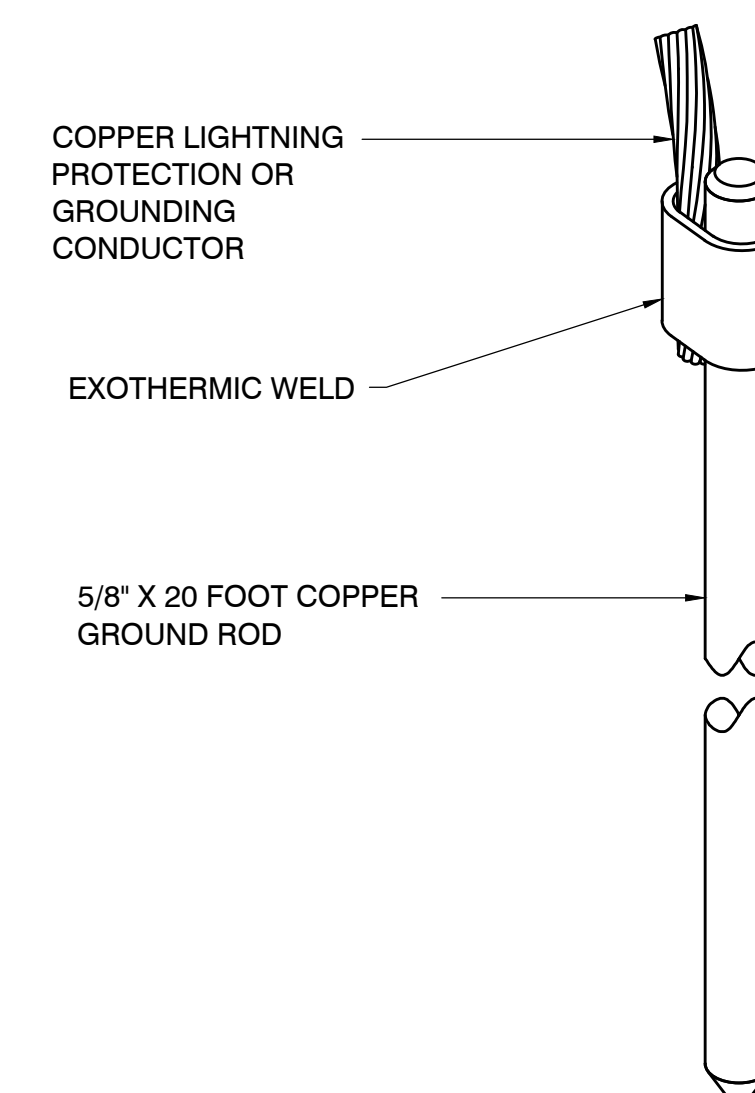
3
E5.



GROUND ROD TEST WELL

SCALE: NTS

4
E5.1



GROUND ROD

SCALE: NTS

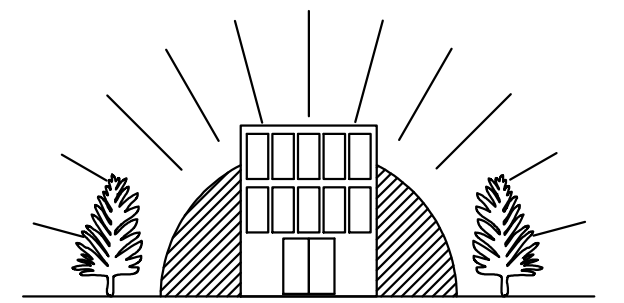
5
E5.1



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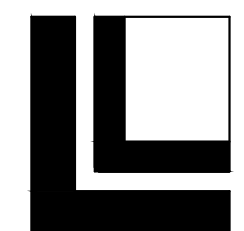
ARCHITECT:



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FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

[illegible]

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DESIGNED BY: BKW
REVIEWED BY: BKW

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

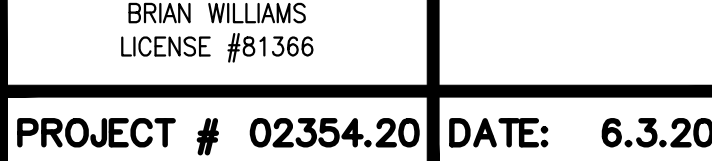
SHEET TITLE
TYPICAL LIGHTNING
PROTECTION DETAILS

BRIAN WILLIAMS
LICENSE #81366

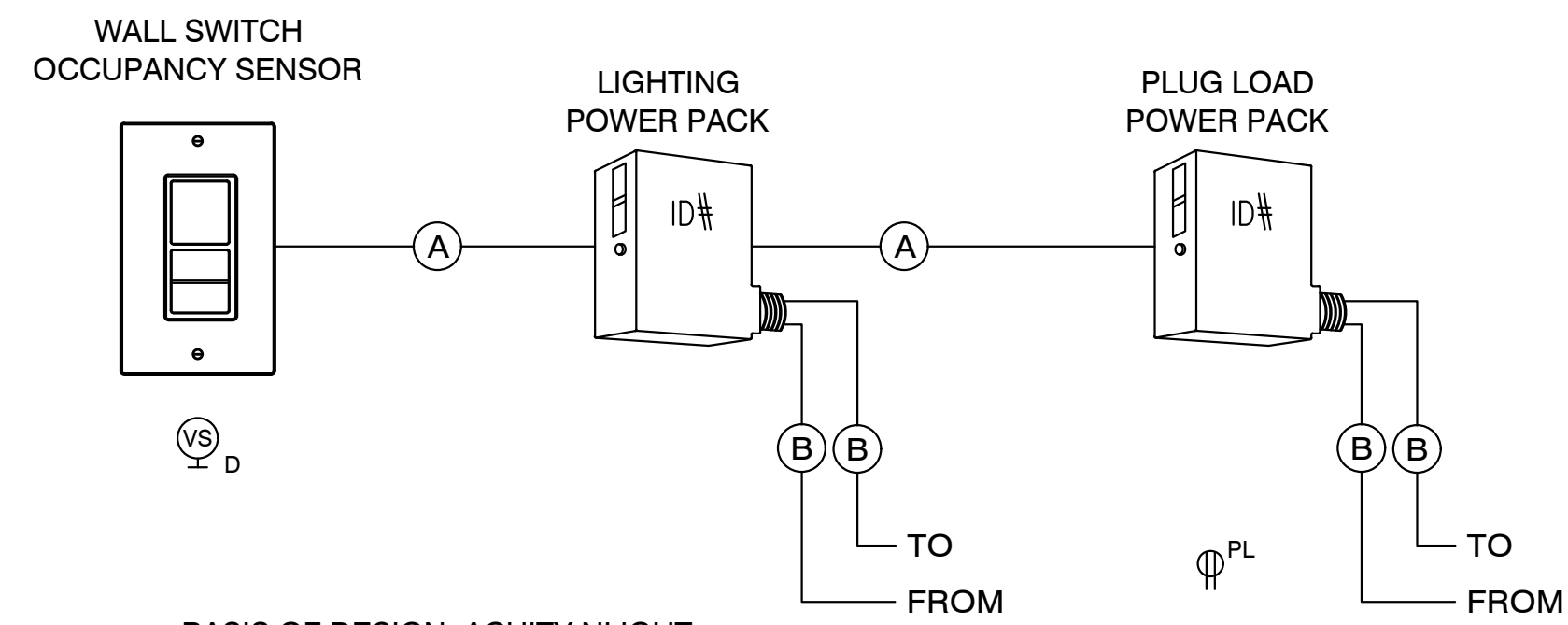
SHEET #
E5.1

PROJECT # 02354.20	DATE: 6.3.2018
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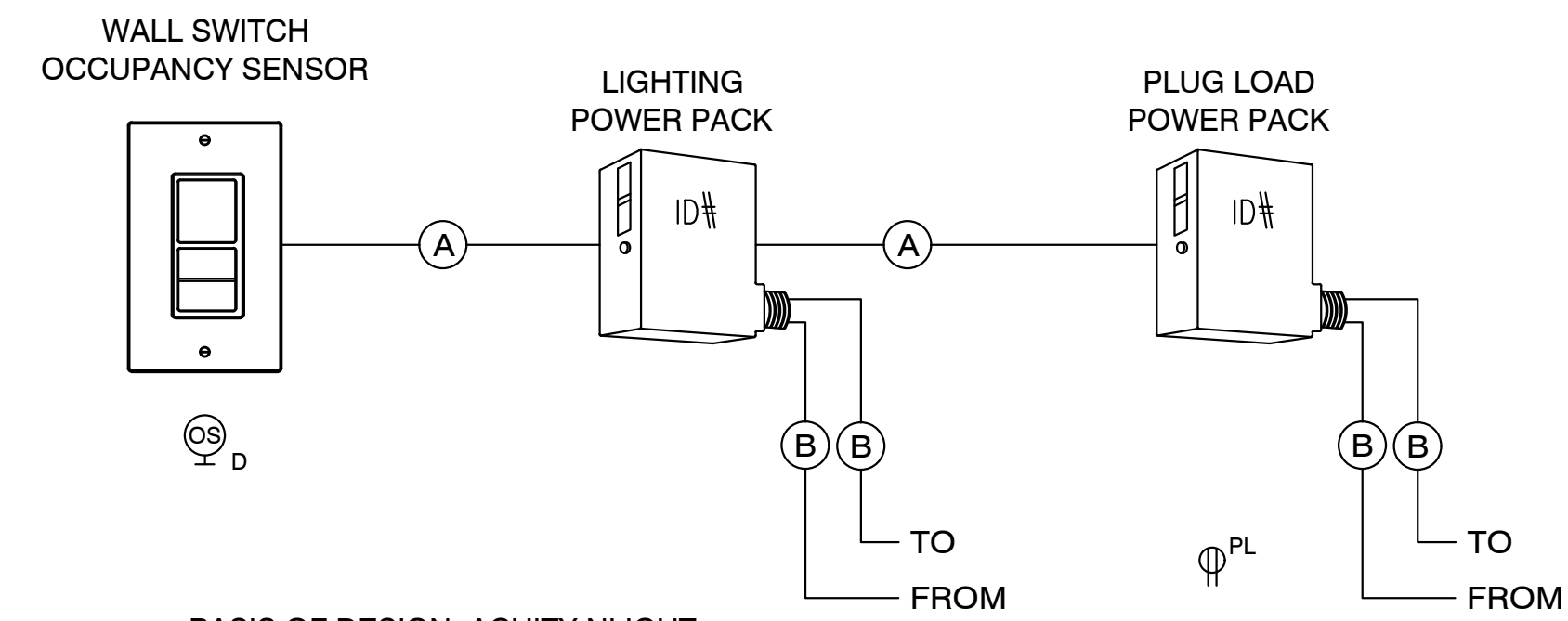
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BASIS OF DESIGN: ACUITY NLIGHT.

NUMBER OF SWITCHES AND SENSORS AS SHOWN ON THE PLANS.

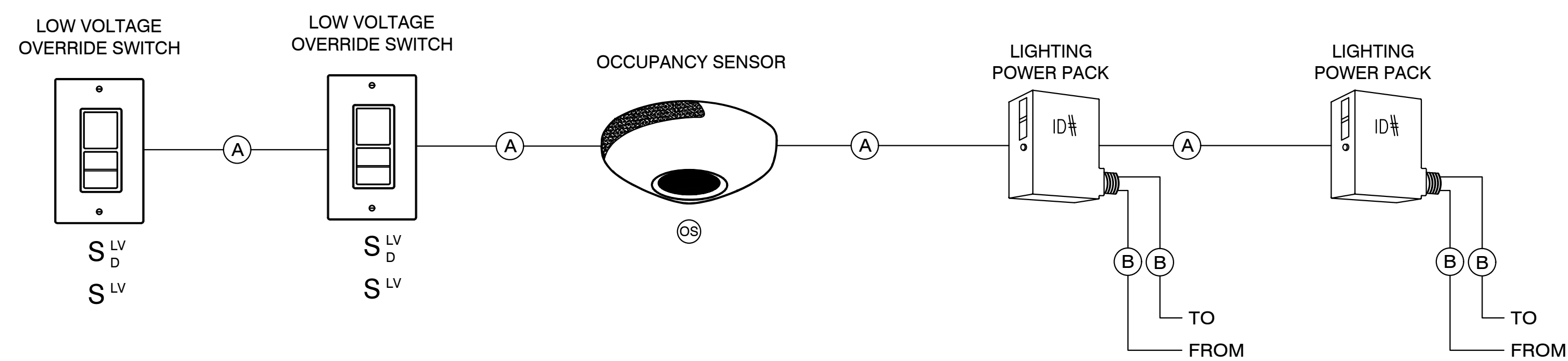
LIGHTING CONTROL DIAGRAM - MANUAL ON / AUTO OFF WITH PLUG LOAD
N.T.S.



BASIS OF DESIGN: ACUITY NLIGHT.

NUMBER OF SWITCHES AND SENSORS AS SHOWN ON THE PLANS.

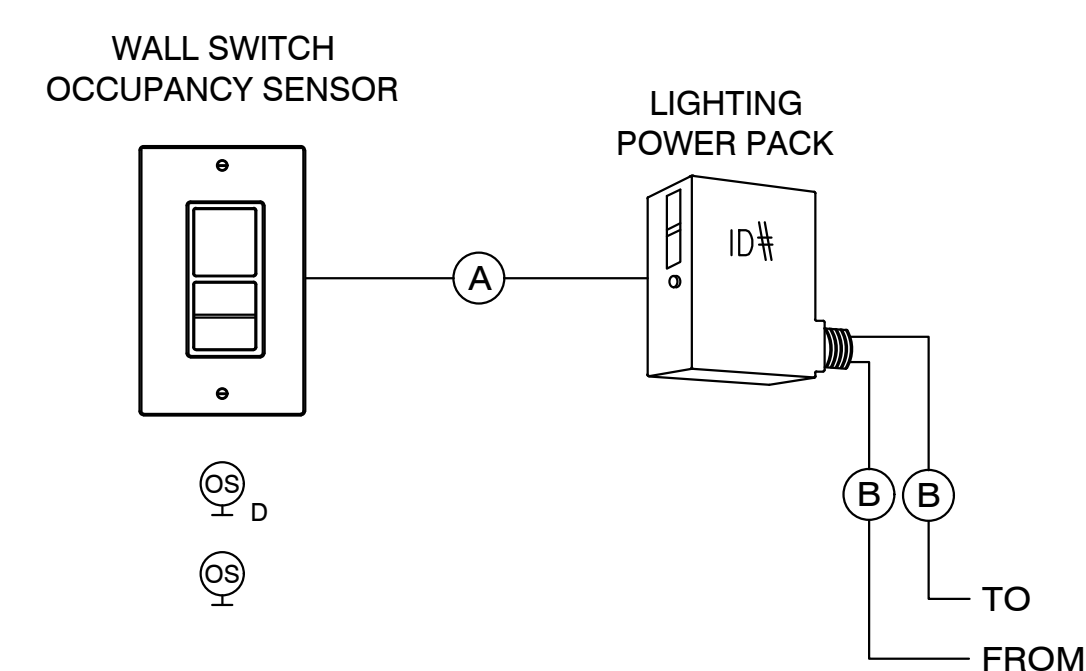
LIGHTING CONTROL DIAGRAM - AUTO ON / AUTO OFF WITH PLUG LOAD
N.T.S.



BASIS OF DESIGN: ACUITY NLIGHT.

NUMBER OF SWITCHES AND SENSORS AS SHOWN ON THE PLANS.

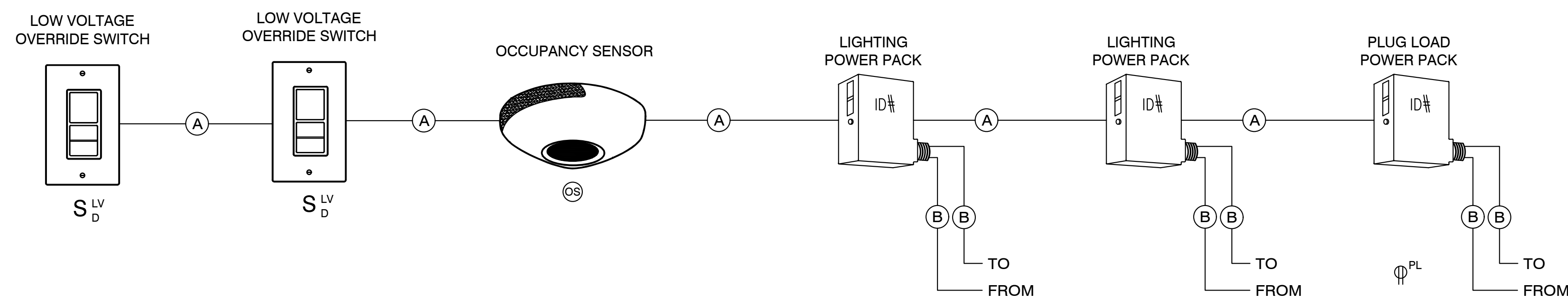
LIGHTING CONTROL DIAGRAM - AUTO ON / AUTO OFF - CEILING SENSORS AND WALL OVERRIDE SWITCHES
N.T.S.



BASIS OF DESIGN: ACUITY NLIGHT.

NUMBER OF SWITCHES AND SENSORS AS SHOWN ON THE PLANS.

LIGHTING CONTROL DIAGRAM - AUTO ON / AUTO OFF
N.T.S.



BASIS OF DESIGN: ACUITY NLIGHT.

NUMBER OF SWITCHES AND SENSORS AS SHOWN ON THE PLANS.

LIGHTING CONTROL DIAGRAM - AUTO ON / AUTO OFF - CEILING SENSORS AND WALL OVERRIDE SWITCHES WITH PLUG LOAD
N.T.S.

WIRE LEGEND	
	CAT 5 (LOW VOLTAGE)
	CLASS 1 (LINE VOLTAGE)
	CLASS 2 (LOW VOLTAGE)

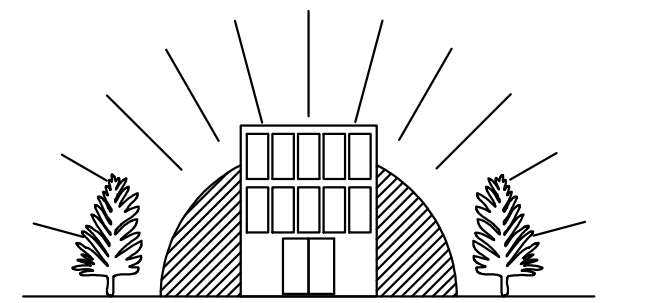
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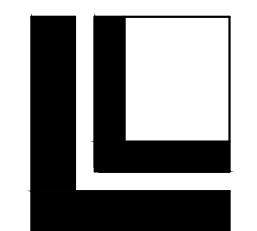
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ARCHITECT:



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CONSULTANTS:[illegible]

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REVIEWED BY: BKW

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THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
LIGHTING CONTROL
DIAGRAMS

196.1 SHEET #

BRIAN WILLIAMS
LICENSE #81366

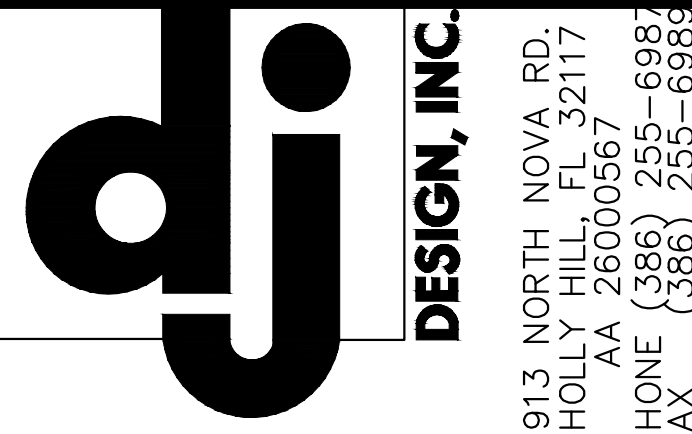
PROJECT # 02354.20	DATE: 6.3.2018
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TYPE	DESCRIPTION	CATALOG	LAMP	VOLTAGE	REMARKS
A	4' LOW PROFILE LED WRAPAROUND FIXTURE. 4800 LUMENS, CURVED RIBBED DIFFUSER, 82 CRI, 4000K CCT. WHITE FINISH.	LITHONIA# BLWP4-48L-ADP-EZ1-LP840	40W LED	120/277	MOUNT FIXTURE AT 8'-0" ABOVE LANDING FOR WALL MOUNTED APPLICATIONS IN STAIRWELLS.
AE	4' LOW PROFILE LED WRAPAROUND FIXTURE. 4800 LUMENS, CURVED RIBBED DIFFUSER, 82 CRI, 4000K CCT. WHITE FINISH. EMERGENCY BATTERY BACKUP.	LITHONIA# BLWP4-48L-ADP-EZ1-LP840-EL14L	40W LED	120/277	MOUNT FIXTURE AT 8'-0" ABOVE LANDING FOR WALL MOUNTED APPLICATIONS IN STAIRWELLS.
A2E	4' LOW PROFILE LED WRAPAROUND FIXTURE. 6000 LUMENS, CURVED RIBBED DIFFUSER, 82 CRI, 4000K CCT. WHITE FINISH. EMERGENCY BATTERY BACKUP.	LITHONIA #BLWP4-60L-ADP-EZ1-LP840-EL14L	49W LED	120/277	
A3	2' LOW PROFILE LED WRAPAROUND FIXTURE. 2000 LUMENS, CURVED RIBBED DIFFUSER, 82 CRI, 4000K CCT. WHITE FINISH.	LITHONIA# BLWP2-20L-ADP-EZ1-LP840	17W LED	120/277	
B	TRAC LIGHTING WITH 10W LED HEAD. 808 LUMENS, 80 CRI, 4000K CCT. BLACK FINISH.	JUNO #R600L-40K-80CRI-NFL-TRACK-HEAD-BL	10W LED	120/277	
C	2'x4' ARCHITECTURAL RECESSED LED FIXTURE. 4000 LUMENS, CURVED, RIBBED DIFFUSER, 82 CRI, 4000K CCT. WHITE FINISH	LITHONIA #2BLT4-40L-ADP-LP840	31W LED	120/277	
CE	2'x4' ARCHITECTURAL RECESSED LED FIXTURE. 4000 LUMENS, CURVED, RIBBED DIFFUSER, 82 CRI, 4000K CCT. WHITE FINISH. EMERGENCY BATTERY BACKUP.	LITHONIA #2BLT4-40L-ADP-LP840-EL14L	31W LED	120/277	
D	4" RECESSED, OPEN LED DOWNLIGHT. 1000 LUMEN OUTPUT, 4000K CCT, 11W LED, DIMMABLE. GALVANIZED STEEL FRAME, MATTE DISFFUSE FINISH CLEAR TRIM, WHITE PAINTED FLANGE. LISTED FOR WET LOCATIONS.	LITHONIA #LDN4-40/10-L04AR-LD-MVOLT-EZ10-TRW	11W LED	120/277	
DE	4" RECESSED, OPEN LED DOWNLIGHT. 1000 LUMEN OUTPUT, 4000K CCT, 11W LED, DIMMABLE. GALVANIZED STEEL FRAME, MATTE DISFFUSE FINISH CLEAR TRIM, WHITE PAINTED FLANGE. LISTED FOR WET LOCATIONS. EMERGENCY BATTERY BACKUP.	LITHONIA #LDN4-40/10-L04AR-LD-MVOLT-EZ10-TRW-E10WCP	11W LED	120/277	
D2	4" RECESSED, OPEN LED DOWNLIGHT. 1500 LUMEN OUTPUT, 4000K CCT, 18W LED, DIMMABLE, GALVANIZED STEEL FRAME, MATTE DISFFUSE FINISH CLEAR TRIM, WHITE PAINTED FLANGE.	LITHONIA #LDN4-40/15-L04AR-LD-MVOLT-EZ10-TRW	18W LED	120/277	
D2E	4" RECESSED, OPEN LED DOWNLIGHT. 1500 LUMEN OUTPUT, 4000K CCT, 18W LED, DIMMABLE, GALVANIZED STEEL FRAME, MATTE DISFFUSE FINISH CLEAR TRIM, WHITE PAINTED FLANGE. EMERGENCY BATTERY BACKUP.	LITHONIA #LDN4-40/15-L04AR-LD-MVOLT-EZ10-TRW-E10WCP	18W LED	120/277	
F	19" ROUND, PENDANT MOUNTED, LED FIXTURE. 9731 LUMEN OUTPUT, 80 CRI, 4000K CCT. WHITE FINISH.	LUMINIS #HC1600-DL-L4L90	108W LED	120/277	MOUNT AT 12' ABOVE FINISHED FLOOR TO BOTTOM OF FIXTURE.
FE	19" ROUND, PENDANT MOUNTED, LED FIXTURE. 9731 LUMEN OUTPUT, 80 CRI, 4000K CCT. WHITE FINISH. EMERGENCY BATTERY BACKUP WITH REMOTE TEST SWITCH.	LUMINIS #HC1600-DL-L4L90	108W LED	120/277	MOUNT AT 12' ABOVE FINISHED FLOOR TO BOTTOM OF FIXTURE.
G	4' SURFACE MOUNTED, LED LINEAR STRIP FIXTURE. 4000 LUMEN OUTPUT, 80 CRI, 4000K CCT. WHITE FINISH	LITHONIA #CLX-L48-4000LM-HEF-FDL-MVOLT-GZ10-40K-80CRI-W H-THCLXWH	28W LED	120/277	
GE	4' SURFACE MOUNTED, LED LINEAR STRIP FIXTURE. 4000 LUMEN OUTPUT, 80 CRI, 4000K CCT. WHITE FINISH. EMERGENCY BATTERY BACKUP.	LITHONIA #CLX-L48-4000LM-HEF-FDL-MVOLT-GZ10-40K-80CRI-W H-E10WLCF-THCLXWH	28W LED	120/277	
H	4' SURFACE, VANDAL RESISTANT, LED LINEAR FIXTURE. 4600 LUMEN OUTPUT, 82 CRI, 4000K CCT, MARINE GRADE ALUMINUM HOUSING. GREY FINISH. WET LOCATION LISTED.	LUMINAIRE LED #VPF44-25W-4000K-MVOLT-CP-GRY-DIM-WET-OCBCF	25W LED	120/277	
H2	WALL MOUNTED LED VAPORTIGHT FIXTURE, 600 LUMENS OUTPUT, 4000K CCT, GREY CORROSION RESISTANT FINISH	LITNONIA #OLVTWM-4000K	15W LED	120/277	
V	25" WALL MOUNTED LED VANITY FIXTURE. 2076 LUMEN OUTPUT, 4000K CCT, 16W LED, COLD-ROLLED STEEL HOUSING, BRUSHED NICKEL FINISH.	BROWNLEE LIGHTING #5174LED-25-BN-H16-40K	16W LED	120/277	MOUNT FIXTURE AT 4" ABOVE TOP OF MIRROR TO BOTTOM.
V2	49" WALL MOUNTED LED VANITY FIXTURE. 4119 LUMEN OUTPUT, 4000K CCT, 32W LED, COLD-ROLLED STEEL HOUSING, BRUSHED NICKEL FINISH.	BROWNLEE LIGHTING #5174LED-49-BN-H32-40K	32W LED	120/277	MOUNT FIXTURE AT 4" ABOVE TOP OF MIRROR TO BOTTOM.
W	HIGH PERFORMANCE ARCHITECTURAL, FULL CUT OFF WALL PACK. 6328 LUMEN OUTPUT, 4000K CCT, 80CRI, 56W LED, TEXTURED DARK BRONZE FINISH.	NLS LIGHTING #NV-W-T4-16L-1-40K-UNV-WM-BRZ	56W LED	120/277	MOUNT AT 12' ABOVE FINISHED FLOOR TO BOTTOM OF FIXTURE.
W2	ARCHITECTURAL WALL SCONCE LED FIXTURE, 2000 LUMENS OUTPUT, 4000K CCT, 80 CRI, 18W LED. TEXTURED DARK BRONZE FINISH.	LITHONIA #WDGE2 LED-P2-40K-80CRI-VF-MVOLT-DBDXTD	18W LED	120/277	MOUNT FIXTURE AT 8'-0" ABOVE FINISHED FLOOR OR STAIR LANDING
X	LED EXIT SIGN, RED LETTERS, DIE-CAST BRUSHED ALLUMINUM FACE.	LITHONIA #LQC-1-R-ELN	1W LED	120/277	MOUNT FIXTURE AT 4" ABOVE TOP OF DOOR FRAME TO BOTTOM.

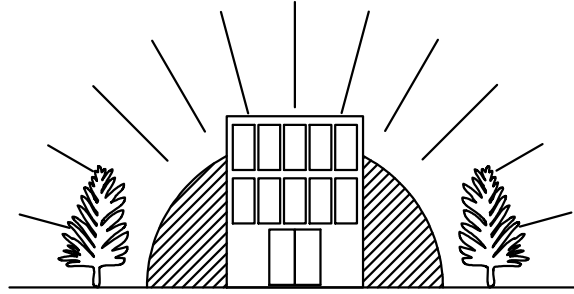
DESCRIPTION	TAG	VOLTAGE	PHASE	SIZE					FED FROM	NOTES
				KW	HP	MCA	MOCP	CONDUIT AND WIRE		
AIR HANDLING UNIT	AHU-1	480	3			19	20	3#12, 1#12G, 3/4"C	H1-7:9:11	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
AIR HANDLING UNIT	AHU-2	480	3			20	20	3#12, 1#12G, 3/4"C	H1-13:15:17	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
AIR HANDLING UNIT	AHU-3	480	3			20	20	3#12, 1#12G, 3/4"C	H2-19:21:23	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
AIR HANDLING UNIT	AHU-4	480	3			20	20	3#12, 1#12G, 3/4"C	H2-25:27:29	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
AIR HANDLING UNIT	AHU-5	480	3			19	20	3#12, 1#12G, 3/4"C	H1-19:21:23	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
AIR HANDLING UNIT	AHU-6	480	3			19	20	3#12, 1#12G, 3/4"C	H2-31:33:35	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
AIR HANDLING UNIT	AHU-7	480	3			20	20	3#12, 1#12G, 3/4"C	H2-37:39:41	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
AIR HANDLING UNIT	AHU(E)	480	3					3#6, 1#10G, 1"C	H2-13:15:17	PROVIDE 60A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE. CONTRACTOR SHALL VERIFY HEATER INSTALLED AND PROVIDE FUSE SIZES AS REQUIRED.
AIR HANDLING UNIT	AHU-8	480	3			8.38	15	3#12, 1#12G, 3/4"C	MDP	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
AIR HANDLING UNIT	AHU-9	480	3			8.38	15	3#12, 1#12G, 3/4"C	MDP	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
CONDENSING UNIT	CU-1	480	3			10.7	15	3#12, 1#12G, 3/4"C	H1-8:10:12	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
CONDENSING UNIT	CU-2	480	3			14	20	3#12, 1#12G, 3/4"C	H1-14:16:18	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
CONDENSING UNIT	CU-3	480	3			14	20	3#12, 1#12G, 3/4"C	H2-20:22:24	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
CONDENSING UNIT	CU-4	480	3			14	20	3#12, 1#12G, 3/4"C	H2-26:28:30	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
CONDENSING UNIT	CU-5	480	3			10.7	15	3#12, 1#12G, 3/4"C	H1-20:22:24	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
CONDENSING UNIT	CU-6	480	3			10.7	15	3#12, 1#12G, 3/4"C	H2-32:34:36	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
CONDENSING UNIT	CU-7	480	3			14	20	3#12, 1#12G, 3/4"C	H2-38:40:42	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
CONDENSING UNIT	CU(E)	480	3			23.3	35	3#8, 1#10G, 1"C	H2-14:16:18	PROVIDE 60A FUSED DISCONNECT SWITCH IN NEMA 3R ENCLOSURE.
CONDENSING UNIT	CU-8	480	3			49	60	3#6, 1#10G, 1"C	MDP	PROVIDE 60A FUSED DISCONNECT SWITCH IN NEMA 3R ENCLOSURE.
CONDENSING UNIT	CU-9	480	3			49	60	3#6, 1#10G, 1"C	MDP	PROVIDE 60A FUSED DISCONNECT SWITCH IN NEMA 3R ENCLOSURE.
EXHAUST FAN	EF-1	120	1	0.128			15	2#12, 1#12G, 3/4"C	L1-1	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
EXHAUST FAN	EF-2	120	1	0.128			15	2#12, 1#12G, 3/4"C	L1-1	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
EXHAUST FAN	EF-3	120	1	0.128			15	2#12, 1#12G, 3/4"C	L1-1	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
EXHAUST FAN	EF-4	120	1		1/8		15	2#12, 1#12G, 3/4"C	L2-1	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
EXHAUST FAN	EF-5	120	1		1/15		15	2#12, 1#12G, 3/4"C	L2-1	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
EXHAUST FAN	EF-6	120	1	0.128			15	2#12, 1#12G, 3/4"C	L2-11	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
EXHAUST FAN	EF-7	120	1	0.128			15	2#12, 1#12G, 3/4"C	L2-11	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
EXHAUST FAN	EF-8	120	1	0.128			15	2#12, 1#12G, 3/4"C	L1-13	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
EXHAUST FAN	EF-9	120	1	0.128			15	2#12, 1#12G, 3/4"C	L2-9	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
EXHAUST FAN	EF-10	120	1	0.128			15	2#12, 1#12G, 3/4"C	L2-9	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
MINI SPLIT UNIT	AC-1	208	1			17.1	20	2#12, 1#12G, 3/4"C	L1-5:7	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
MINI SPLIT UNIT	ACU-1	208	1			17.1	20	2#12, 1#12G, 3/4"C	L1-9:11	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 3R ENCLOSURE.
ELECTRIC WATER HEATER	EWH-1	480	3	6			20	3#12, 1#12G, 3/4"C	H1-2:4:6	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
ELECTRIC WATER HEATER	EWH-2	480	3	10			20	3#12, 1#12G, 3/4"C	H2-2:4:6	PROVIDE 30A FUSED DISCONNECT SWITCH IN NEMA 1 ENCLOSURE.
RECIRCULATION PUMP	RCP-1	120	1		1/8		15	2#12, 1#12G, 3/4"C	L1-3	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
RECIRCULATION PUMP	RCP-2	120	1		1/8		15	2#12, 1#12G, 3/4"C	L2-3	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
AIR CURTAIN	FF-1	208	1		1/5		15	2#12, 1#12G, 3/4"C	L2-5:7	PROVIDE 20A TOGGLE TYPE DISCONNECT SWITCH.
ELEVATOR	ELEV-1	480	3					3#3, 1#8G, 1-1/4"C	H1-25:27:29	PROVIDE 100A FUSED DISCONNECT SWITCH.
ELEVATOR CAB LIGHTS AND RECEPTACLE	ELEV-1	120	1					2#12, 1#12G, 3/4"C	L1-32	PROVIDE 30A FUSED DISCONNECT SWITCH.
ELEVATOR	ELEV-2	480	3					3#3, 1#8G, 1-1/4"C	H2-8:10:12	PROVIDE 100A FUSED DISCONNECT SWITCH.
ELEVATOR CAB LIGHTS AND RECEPTACLE	ELEV-2	120	1					2#12, 1#12G, 3/4"C	L3-36	PROVIDE 30A FUSED DISCONNECT SWITCH.

* NOTES: EQUIPMENT PROVIDED UNDER BID ALTERNATIVE

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ARCHITECT:

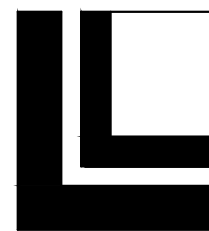


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EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

[illegible]

DRAWN BY: BKW
DESIGNED BY: BKW
REVIEWED BY: BKW

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
ELECTRICAL
SCHEDULES

SHEET 07.0

BRIAN WILLIAMS
LICENSE #81366

PROJECT # 02354.20 | DATE: 6.3.2018

ELECTRICAL LOAD SUMMARY - MDP		
LOAD DESCRIPTION	TOTAL CONNECTED	TOTAL DEMAND
	(KVA)	(KVA)
EXISTING LOADS	30.00	24.00
PANEL H1	124.31	98.12
PANEL H2	178.37	150.77
AHU-8 (EXST)	6.23	4.99
AHU-9 (EXST)	6.23	4.98
CU-8 (EXST)	43.80	35.04
CU-9 (EXST)	43.80	35.04
TOTALS	432.74	352.94
AMPS AT 480V/3Ø	521	425

PANELBOARD: H1																		
V,P,W:480/277,3Ø,4W				RATING: 225A														
BUS MATERIAL: COPPER				TYPE: 225A M.C.B.										MOUNTING: SURFACE				
REMARKS:				BREAKER TYPE: BOLT-ON										ENCLOSURE: NEMA 1				
				INT. RATING: 14 KAIC										LOCATION: STORAGE 128				
CKT	LOAD DESCRIPTION			CB		PHASE LOAD (VA)				CB		LOAD DESCRIPTION			CKT			
#				P	TRIP	A		B		C					TRIP	P	#	
1	LTG - FIRST FLOOR			1	20	2034	2000								2			
3	LTG - EXTERIOR			1	20			498	2000						4			
5	LTG - SECOND FLOOR			1	20					1254	2000				6			
7	HVAC - AHU-1			3	20	3915	2223								8			
9								3915	2223						15	3		10
11										3915	2223						12	
13	HVAC - AHU-2			3	20	4275	2909								14			
15								4275	2909						20	3		16
17										4275	2909						18	
19	HVAC - AHU-5			3	20	3915	2223								20			
21								3915	2223					15	3		22	
23										3915	2223						24	
25	EQUIP - ELEV-1			3	100	5817									26			
27								5817						20	1		28	
29										5817				20	1		30	
31	SPARE			1	20										32			
33	SPARE			1	20										34			
35	SPARE			1	20										36			
37	EQUIP - PANEL LP VIA XFMR TX-LP			3	70	13837									38			
39								11925						30	3		40	
41										12930							42	
CONNECTED LOAD= 124309 VA						43148		39700		41461		DEMAND LOAD= 98125 VA						

PANEL: H1	REC	LTG/CONT.	HVAC	EQUIP
CONNECTED VA	0	9786	58380	56143
DEMAND FACTOR	NEC	125%	75%	75%
DEMAND VA	0	12233	43785	42107
TOTAL CONNECTED AMPS:	150 A			
TOTAL DEMAND AMPS:	118 A			

PANELBOARD: H2															
V.P.W:480/277,3Ø,4W			RATING: 400A												
BUS MATERIAL: COPPER			TYPE: 250A M.C.B.								MOUNTING: SURFACE				
REMARKS:			BREAKER TYPE: BOLT-ON								ENCLOSURE: NEMA 1				
			INT. RATING: 14 KAIC								LOCATION: OUTDOOR STORAGE 117				
CKT	LOAD DESCRIPTION		CB		PHASE LOAD (VA)					CB		LOAD DESCRIPTION		CKT	
#			P	TRIP	A		B		C		TRIP			P	#
1	LTG - FIRST FLOOR		1	20	1564	3333								2	
3	LTG - EXTERIOR		1	20			274	3333			20	3	CONT - EWH-2	4	
5	LTG - FIRST FLOOR		1	20					2079	3333				6	
7	LTG - SECOND FLOOR		1	20	1322	5817								8	
9	LTG - SECOND FLOOR		1	20			1296	5817			100	3	EQUIP - ELEV-2	10	
11	SPARE		1	20					5817					12	
13	HVAC - AHU-E		3	60	4275	4840					35	3	HVAC - CU-E	14	
						4275	4840								16
17									4275	4840					
19	HVAC - AHU-3		3	20	4275	2909					20	3	HVAC - CU-3	20	
						4275	2909								22
23									4275	2909					
25	HVAC - AHU-4		3	20	4275	2909					20	3	HVAC - CU-4	26	
27							4275	2909							28
29									4275	2909					
31	HVAC - AHU-6		3	20	3915	2223					15	3	HVAC - CU-6	32	
33							3915	2223							34
35									3915	2223					
37	HVAC - AHU-7		3	20	3915	2909					20	3	HVAC - CU-7	38	
39							3915	2909							40
41									3915	2909					
43	SPARE		1	20							20	1	SPARE	44	
45	SPARE		1	20							20	1	SPARE	46	
47	SPARE		1	20							20	1	SPARE	48	
49	EQUIP - PANEL LP VIA XFMR TX-LP		3	70	13187						30	3	SURGE PROTECTIVE DEVICE	50	
51							10976								52
53									10887						
CONNECTED LOAD= 178370 VA					61668		58141		58561		DEMAND LOAD= 150770 VA				

PANEL: H2	REC	CONT.	HVAC	EQUIP
CONNECTED VA	0	33985	109335	35050
DEMAND FACTOR	NEC	125%	75%	75%
DEMAND VA	0	42481	82001	26288
TOTAL CONNECTED AMPS:	215 A			
TOTAL DEMAND AMPS:	181 A			

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<

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CONSULTANTS:

REV #	ISSUES / REVISIONS	12.30.2018
1	SCHEMATIC DESIGN	02.28.2020
2	DESIGN DEVELOPMENT	04.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	06.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	03.05.2021

DRAWN BY: BKW
DESIGNED BY: BKW
REVIEWED BY: BKW

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

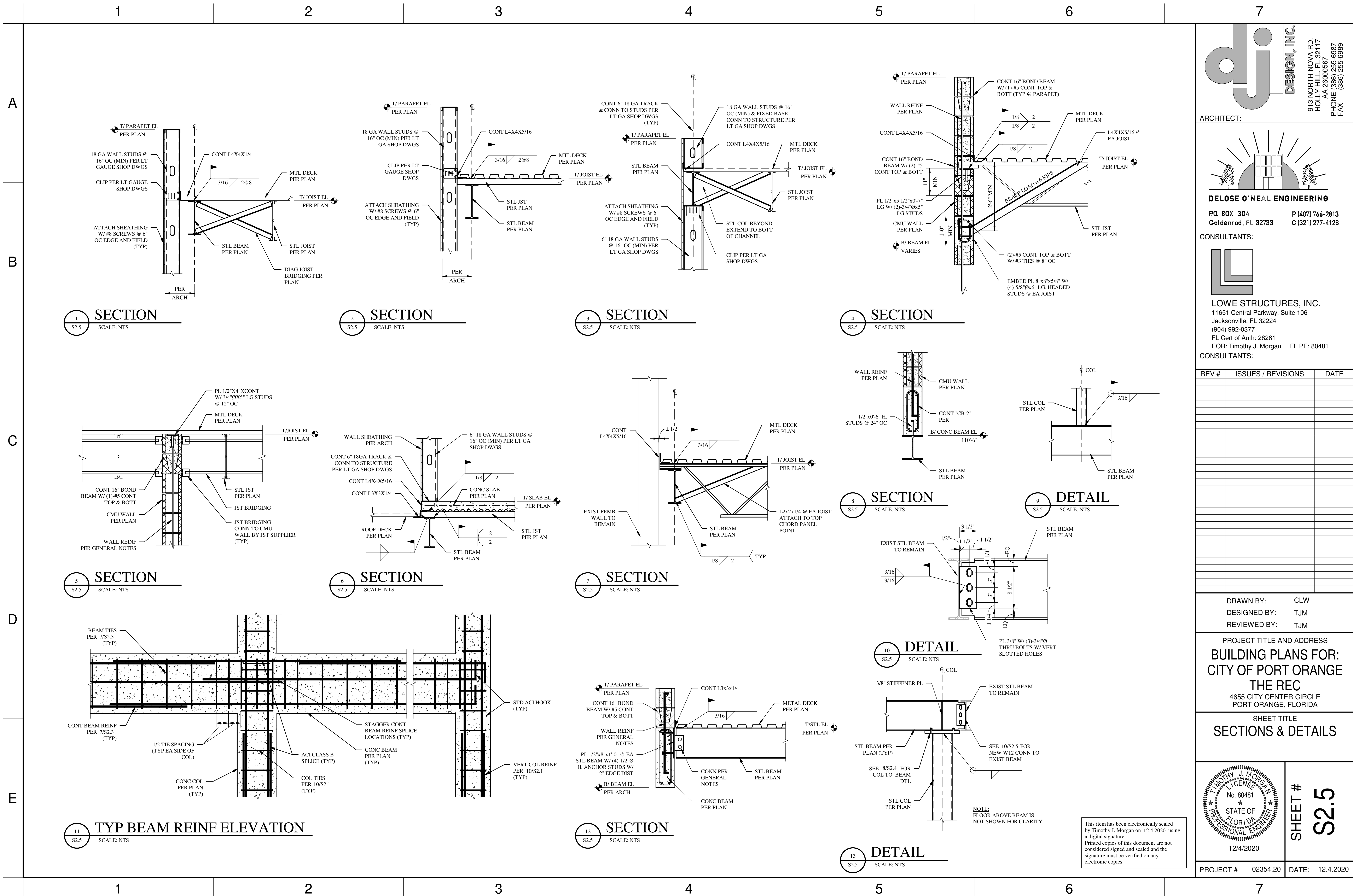
SHEET TITLE
PANEL SCHEDULES

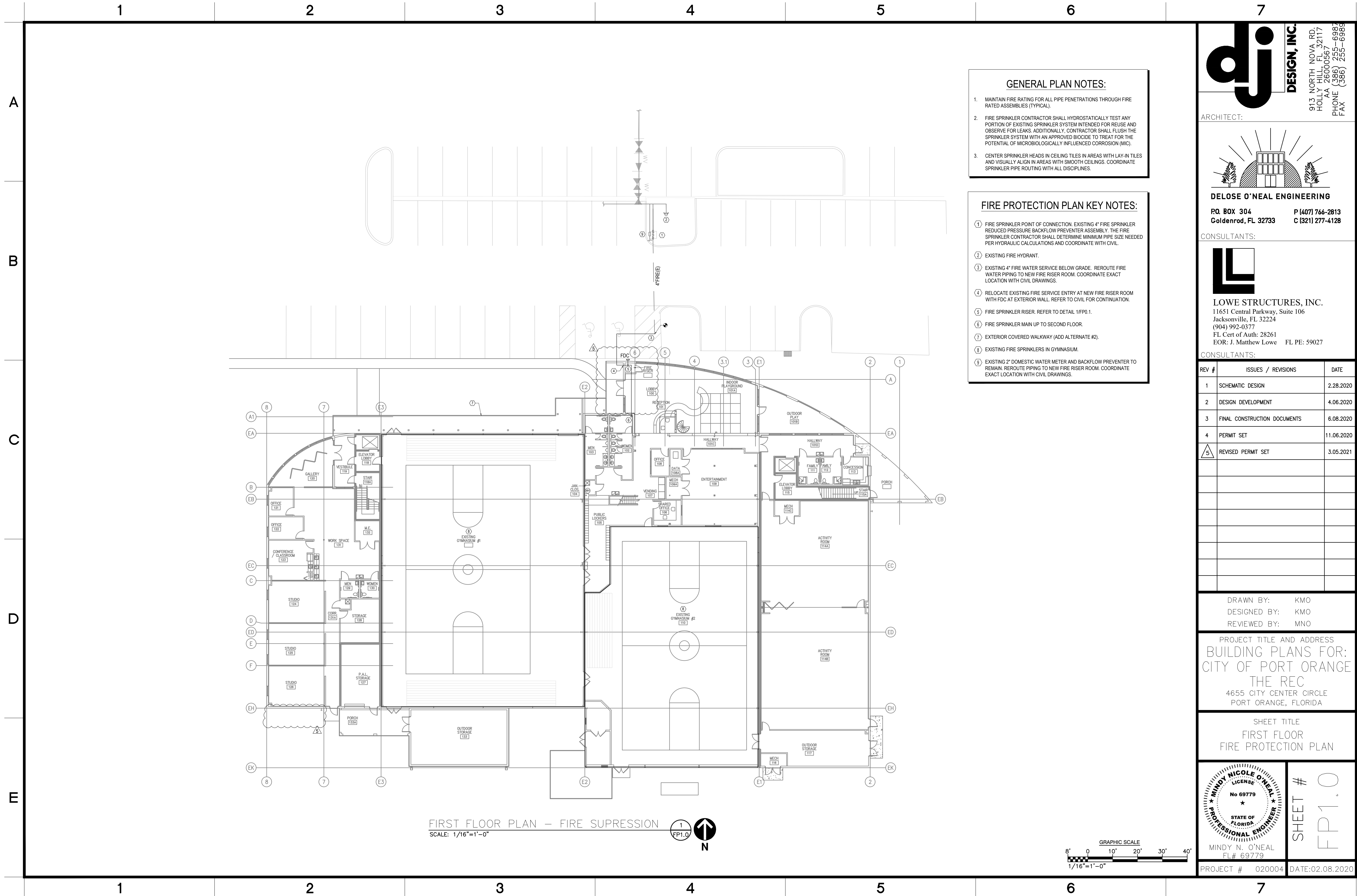
PROJECT # 02354.20

DATE: 6.3.2018

BRIAN WILLIAMS
LICENSE #81366

SHEET #





GENERAL PLAN NOTES:

1. MAINTAIN FIRE RATING FOR ALL PIPE PENETRATIONS THROUGH FIRE RATED ASSEMBLIES (TYPICAL).
2. FIRE SPRINKLER CONTRACTOR SHALL HYDROSTATICALLY TEST ANY PORTION OF EXISTING SPRINKLER SYSTEM INTENDED FOR REUSE AND OBSERVE FOR LEAKS. ADDITIONALLY, CONTRACTOR SHALL FLUSH THE SPRINKLER SYSTEM WITH AN APPROVED BIOCIDES TO TREAT FOR THE POTENTIAL OF MICROBIOLOGICALLY INFLUENCED CORROSION (MIC).
3. CENTER SPRINKLER HEADS IN CEILING TILES IN AREAS WITH LAY-IN TILES AND VISUALLY ALIGN IN AREAS WITH SMOOTH CEILINGS. COORDINATE SPRINKLER PIPE ROUTING WITH ALL DISCIPLINES.

FIRE PROTECTION PLAN KEY NOTES:

- ① FIRE SPRINKLER POINT OF CONNECTION. EXISTING 4" FIRE SPRINKLER REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY. THE FIRE SPRINKLER CONTRACTOR SHALL DETERMINE MINIMUM PIPE SIZE NEEDED PER HYDRAULIC CALCULATIONS AND COORDINATE WITH CIVIL.
- ② EXISTING FIRE HYDRANT.
- ③ EXISTING 4" FIRE WATER SERVICE BELOW GRADE. REROUTE FIRE WATER PIPING TO NEW FIRE RISER ROOM. COORDINATE EXACT LOCATION WITH CIVIL DRAWINGS.
- ④ RELOCATE EXISTING FIRE SERVICE ENTRY AT NEW FIRE RISER ROOM WITH FDC AT EXTERIOR WALL. REFER TO DETAIL 1/FP0.1.
- ⑤ FIRE SPRINKLER RISER. REFER TO DETAIL 1/FP0.1.
- ⑥ FIRE SPRINKLER MAIN UP TO SECOND FLOOR.
- ⑦ EXTERIOR COVERED WALKWAY (ADD ALTERNATE #2).
- ⑧ EXISTING FIRE SPRINKLERS IN GYMNASIUM.
- ⑨ EXISTING 2" DOMESTIC WATER METER AND BACKFLOW PREVENTER TO REMAIN. REROUTE PIPING TO NEW FIRE RISER ROOM. COORDINATE EXACT LOCATION WITH CIVIL DRAWINGS.

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REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	3.05.2021

DRAWN BY: KMO
DESIGNED BY: KMO
REVIEWED BY: MNO

PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**FIRST FLOOR
FIRE PROTECTION PLAN**

MINDY N. O'NEAL
FL# 69779
PROJECT # 020004
DATE: 02.08.2020
SHEET # **FP1.0**

A

B

C

D

E

OUTSIDE AIR CALCULATION								
AREA SERVED	AREA (SQFT)	# PEOPLE	CFM / PERSON	PEOPLE OUTSIDE AIR (CFM)	CFM/SQFT	SQ.FT. OUTSIDE AIR (CFM)	TOTAL CFM CALCULATED	CFM SUPPLIED
100 LOBBY	383	10	5	50	0.06	23	73	150
101 RECEPTION	150	4	5	20	0.06	9	29	100
101A INDOOR PLAY	791	20	5	100	0.06	47	147	150
101C HALLWAY	488	0	-	-	0.06	29	29	50
101D HALLWAY	331	0	-	-	0.06	20	21	50
105 PUBLIC LOCKERS	831	25	5	125	0.06	50	175	175
106 SHARED OFFICE	110	3	5	15	0.06	7	22	50
108 OFFICE	108	3	5	15	0.06	6	21	50
109 ENTERTAINMENT	762	27	10	270	0.06	46	316	320
113 CONCESSION	122	3	5	15	0.06	7	22	25
114A ACTIVITY ROOM	1892	50	7.5	375	0.06	114	489	490
114B ACTIVITY ROOM	2112	50	7.5	375	0.06	127	501	505
117 OUTDOOR STOR.	563	-	-	-	0.12	68	68	75
120 GALLERY	397	16	7.5	120	0.06	24	144	145
121 OFFICE	113	3	5	15	0.06	7	22	50
122 OFFICE	126	3	5	15	0.06	8	23	50
123 CONFERENCE	288	15	5	75	0.06	17	92	100
124 STUDIO	378	8	10	80	0.18	68	148	150
125 STUDIO	378	8	10	80	0.18	68	148	150
126 STUDIO	369	8	10	80	0.18	66	146	150
127 P.A.L. STORAGE	383	-	-	-	0.12	46	46	50
128 STORAGE	275	-	-	-	0.12	33	33	50
131 WORK SPACE	935	15	5	75	0.06	56	131	135
202 LOUNGE	482	5	5	25	0.06	29	54	55
203 TEEN LOUNGE	189	5	5	25	0.06	11	36	50
206 MULTIPURPOSE	490	10	5	50	0.06	29	79	80
207 MULTIPURPOSE	412	10	5	50	0.06	26	76	80
208 VESTIBULE	313	-	-	-	0.06	19	19	25
209 PARENT LOUNGE	281	10	5	50	0.06	17	67	75
213 CONFERENCE	367	18	5	90	0.06	22	112	115
214 VESTIBULE	48	-	-	-	0.06	3	3	10
214B CORRIDOR	390	-	-	-	0.06	23	23	25
215 P.A.L.	445	10	5	50	0.06	27	77	80
216 BREAKOUT	523	10	5	50	0.06	31	81	85
217 BREAKOUT	651	10	5	50	0.06	39	89	90
221 OFFICE	135	3	5	15	0.06	8	23	50
222 BREAKOUT	167	5	5	25	0.06	10	35	50
223 BREAKOUT	192	5	5	25	0.06	12	37	40
PER TABLE 403.3.1.1 - FLORIDA BUILDING CODE 2017 - MECHANICAL BALANCE TO OUTSIDE AIR QUANTITIES SHOWN.							TOTAL	4,120

AIR CURTAIN SCHEDULE							
MARK	CFM	MAX VELOCITY (FPM)	MOTOR HP	WEIGHT (LBS)	VOLTS/Ø	CONTROL	BASIS OF DESIGN
FF-1	1,340	3,226	1 @ 1/5	48	208/1	PLUNGER STYLE SWITCH	BERNER CLC08-1048A

MINI-SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE												
MARK	AREA SERVED	NOMINAL TONS	FAN		MCA	MOCP	WEIGHT (LBS.)	COOLING CAPACITY		SEER [EER]	EQUAL TO	
			CFM	V/Ø				TC (MBH)	SC (MBH)		MFG.	MODEL
AC-1	OUTDOOR STORAGE	2.0	700	208/1	1.0	-	50	-	-	-	DAIKIN	FXS24G1
ACU-1	OUTDOOR STORAGE	2.0	-	208/1	17.1	20.0	120	31.4	22.5	19.0	DAIKIN	FXS24G1
NOTES: 1. PROVIDE UNITS WITH FACTORY THERMOSTAT, SINGLE POINT ELECTRICAL CONNECTION. 2. PROVIDE 5 MINUTE ANTI CYCLE TIMER. 3. PROVIDE WITH FACTORY INSTALLED DISCONNECT. 4. PROVIDE UNIT WITH HAIL GUARD. 5. PROVIDE UNIT WITH CONDENSATE PUMP. 6. CFM BASED ON MEDIUM FAN SPEED. 7. BALANCE TO REQUIRED OUTSIDE AIR QUANTITY.												

LOUVER SCHEDULE					
MARK	SERVICE	SIZE		BIRD SCREEN	REMARKS
		LENGTH (IN)	HEIGHT (IN)		
L-1	SEE PLANS	20	16	YES	GREENHECK ESD-435X 1, 2
L-2	SEE PLANS	24	12	YES	GREENHECK ESD-635X 1, 2
L-3	SEE PLANS	24	14	YES	GREENHECK ESD-635X 1, 2
NOTES: 1. PROVIDE HORIZONTAL, DRAINABLE ALUMINUM, BAKED ENAMEL FINISH. 2. MATCH COLOR OF LOUVER TO ADJACENT WALL COLOR.					

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE																						
MARK	AREA SERVED	TONS	INDOOR UNIT										COOLING CAPACITY		OUTDOOR UNIT					EQUAL TO		NOTES
			FAN				ELECTRIC HEATER		UNIT POWER			WEIGHT (LBS.)	TC (MBH)	SC (MBH)	UNIT POWER			WEIGHT (LBS.)	SEER [EER]	MFG.	MODEL	
			CFM	O/A	E.S.P. (IN.)	HP	KW	CONTROL STAGES	V/Ø	MCA	MOCP				V/Ø	MCA	MOCP					
AHU-1 / CU-1	GALLERY/OFFICE	5	2,000	480	0.8	1.0	10.0	1	460/3	19	20	250	58.0	46.4	460/3	10.7	15	250	14.5	LENNOX	CBX27UH-060 / TSA-060H4	SEE NOTES
AHU-2 / CU-2	STUDIOS	6	2,400	550	1.0	2.0	10.0	1	460/3	20	20	475	71.0	56.8	460/3	14.0	20	350	[11.2]	LENNOX	TAA072S4S / TSA-072S4	SEE NOTES
AHU-3 / CU-3	ACTIVITY ROOM	6	2,400	565	1.0	2.0	10.0	1	460/3	20	20	475	71.0	56.8	460/3	14.0	20	350	[11.2]	LENNOX	TAA072S4S / TSA-072S4	SEE NOTES
AHU-4 / CU-4	ACTIVITY ROOM	6	2,400	580	1.0	2.0	10.0	1	460/3	20	20	475	71.0	56.8	460/3	14.0	20	350	[11.2]	LENNOX	TAA072S4S / TSA-072S4	SEE NOTES
AHU-5 / CU-5	BREAKOUT	5	2,000	420	0.8	1.0	10.0	1	460/3	19	20	250	58.0	46.4	460/3	10.7	15	250	14.5	LENNOX	CBX27UH-060 / TSA-060H4	SEE NOTES
AHU-6 / CU-6	LOBBY	5	2,000	400	0.8	1.0	10.0	1	460/3	19	20	250	58.0	46.4	460/3	10.7	15	250	14.5	LENNOX	CBX27UH-060 / TSA-060H4	SEE NOTES
AHU-7 / CU-7	MULTIPURPOSE	6	2,400	480	1.0	2.0	10.0	1	460/3	20	20	475	71.0	56.8	460/3	14.0	20	350	[11.2]	LENNOX	TAA072S4S / TSA-072S4	SEE NOTES
AHU(E) / CU(E)	ADMIN. FIRST FLR.	10	4,000	645	-	2.0	-	-	460/3	-	-	-	-	-	460/3	23.3	35	450	-	-	-	-
NOTES: 1. PROVIDE UNITS WITH PROGRAMMABLE FACTORY THERMOSTAT. 2. PROVIDE 5 MINUTE ANTI CYCLE TIMER. 3. PROVIDE SMOKE DETECTOR IN SUPPLY DUCT AS INDICATED ON PLANS. 4. PROVIDE UNIT WITH HAIL GUARD. 5. PROVIDE WITH MANUFACTURER'S MOTOR AND DRIVE PACKAGE AS REQUIRED TO MEET SCHEDULED AIR CAPACITIES AND PRESSURE DROP. 6. PROVIDE UNITS WITH WATER-LEVEL MONITORING DEVICE. 7. PROVIDE CONTROLS TO ACTUATE OUTSIDE AIR CONTROL DAMPER OPEN UPON UNIT ACTIVATION AND CLOSE WHEN UNIT IF OFF. 8. PROVIDE CONSTRUCTION FILTERS FOR RETURN AIR OPENINGS DURING INSTALLATION. REPLACE FILTERS USED DURING CONSTRUCTION WITH NEW FILTERS. 9. PROVIDE MANUFACTURER RECOMMENDED CONDENSATE PUMP SYSTEM FOR EACH AIR HANDLING UNIT. 10. PROVIDE WITH HUMIDITROL DEHUMIDIFICATION SYSTEM.															ADD ALTERNATE #3 NOTE: 1. PROVIDE ULTRAVIOLET LIGHT KIT IN COIL SECTION OF AIR HANDLING UNIT. POWER LIGHT FROM UNIT.							

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE - ADD ALTERNATE #1																						
MARK	AREA SERVED	NOMINAL TONS	INDOOR UNIT									COOLING CAPACITY		OUTDOOR UNIT					EQUAL TO		NOTES	
			FAN				ELECTRIC HEATER		UNIT POWER			WEIGHT (LBS.)	TC (MBH)	SC (MBH)	UNIT POWER			WEIGHT (LBS.)	SEER [EER]	MFG.		MODEL
			CFM	O/A	E.S.P. (IN.)	HP	KW	CONTROL STAGES	V/Ø	MCA	MOCP				V/Ø	MCA	MOCP					
AHU-8 / CU-8	EXISTING GYM #1	25	10,000	-	0.6	5.0	-	-	460/3	8.38	15	2,130	318.0	296.0	460/3	49.0	60	1,000	[11.7]	TRANE	CSAA021 / TTA30044CAB	SEE NOTES
AHU-9 / CU-9	EXISTING GYM #2	25	10,000	-	0.6	5.0	-	-	460/3	8.38	15	2,130	318.0	296.0	460/3	49.0	60	1,000	[11.7]	TRANE	CSAA021 / TTA30044CAB	SEE NOTES
NOTES:																						
1. PROVIDE EQUIPMENT AS AN ADD ALTERNATE FROM BASE BID CONSTRUCTION DOCUMENTS.													11. CONTRACTOR TO VERIFY DIMENSIONS WITH EXISTING MECHANICAL SPACE PRIOR TO PURCHASE AND INSTALLATION.									
2. PROVIDE 5 MINUTE ANTI CYCLE TIMER.													12. PROVIDE WITH CONDENSER COIL HAIL/VANDAL GUARD KIT.									
3. PROVIDE TEST AND BALANCE ON EXISTING SYSTEM PRIOR TO INSTALLATION TO DETERMINE EXISTING PERFORMANCE CONDITIONS.													13. CONTRACTOR TO VERIFY EXISTING SYSTEM CHARACTERISTICS AND PROVIDE ANY ADDITIONAL CONTROLS AND/OR COMPONENTS AS NECESSARY TO BE AS PART OF THIS ADD ALTERNATE.									
4. PROVIDE CONNECTIONS TO EXISTING SYSTEM AS REQUIRED.																						
5. PROVIDE WITH MANUFACTURER'S MOTOR AND DRIVE PACKAGE AS REQUIRED TO MEET SCHEDULED AIR CAPACITIES AND PRESSURE DROP.																						
6. PROVIDE UNITS WITH WATER-LEVEL MONITORING DEVICE.																						
7. PROVIDE CONTROLS TO ACTUATE OUTSIDE AIR CONTROL DAMPER OPEN UPON UNIT ACTIVATION AND CLOSE WHEN UNIT IF OFF.																						
8. PROVIDE CONSTRUCTION FILTERS FOR RETURN AIR OPENINGS DURING INSTALLATION. REPLACE FILTERS USED DURING CONSTRUCTION WITH NEW FILTERS.																						
9. PROVIDE MANUFACTURER RECOMMENDED DRAIN PANS.																						
10. PROVIDE UNITS WITH PROGRAMMABLE FACTORY THERMOSTAT.																						

FAN SCHEDULE													
MARK	SERVICE	CFM	E.S.P. (IN. WATER)	FAN TYPE	DRIVE	SONES	HP (WATTS)	RPM	WEIGHT (LBS)	V/Ø	MANUFACTURER	MODEL	NOTES
EF-1	129 MEN	100	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-2	130 WOMEN	100	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-3	128A JANITOR	100	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-4	103 MEN	380	0.375	INLINE	DIRECT	8.1	1/8	1,550	60	115/1	GREENHECK	SQ-95-D	1-4
EF-5	102 WOMEN	280	0.375	INLINE	DIRECT	7.3	1/15	1,550	60	115/1	GREENHECK	SQ-80-D	1-4
EF-6	111 FAMILY	120	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-7	112 FAMILY	120	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-8	219 TOILET	100	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-9	204 PUBLIC	100	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-10	212 STAFF	150	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
NOTES: 1. PROVIDE INTEGRAL DISCONNECT SWITCH. 2. PROVIDE MANUFACTURER'S SPEED CONTROL MOUNTED AT UNIT. 3. PROVIDE CONTROL BY MANUAL LIGHT WITH OCCUPANCY SENSOR. COORDINATE WITH ELECTRICAL DRAWINGS FOR LOCATION OF SWITCH. 4. REFER TO MECHANICAL PLANS FOR LOCATION OF EXHAUST TERMINATION.													

AIR DEVICE SCHEDULE						
TAG	MFG./CAT. #	TYPE	NECK	FRAME	FINISH	NOTES
A	PRICE - ASCD	CD	SEE PLANS	12 x 12	BAK. WHT. ENAMEL	1,2,3,4,5
B	PRICE - 80	RAR	22 x 22 (MAX 1280 CFM)	24 x 24	BAK. WHT. ENAMEL	1,2,4,6
C	PRICE - 630	EAR/RAR	SEE PLANS	SEE PLANS	BAK. WHT. ENAMEL	1,2,4,6
D	PRICE - 620	SAR	SEE PLANS	SEE PLANS	BAK. WHT. ENAMEL	1,2,4,6
DEVICE TYPE LEGEND: CD = CEILING DIFFUSER RAR = RETURN AIR REGISTER EAR = EXHAUST AIR REGISTER SAR = SUPPLY AIR REGISTER NOTES: 1. PROVIDE CEILING DEVICES WITH PROPER FRAME STYLE TO MATCH CEILING TYPE AS CALLED FOR BY ARCHITECT. 2. DEVICES SHALL BE PROVIDED WITH FACTORY FINISH. 3. CEILING DIFFUSERS SHALL BE 4-WAY THROW UNLESS NOTED OTHERWISE OR SHOWN ON PLANS WITH DIRECTIONAL ARROW(S). 4. IF NECESSARY, PROVIDE TOP HAT FOR GRILLES REGISTERS AND DIFFUSERS. 5. PROVIDE EQUALIZING GRID (PRICE MODEL FR) FOR DIFFUSERS TAPPED DIRECTLY FROM BOTTOM OF DUCT. PROVIDE OPPOSED BLADE DAMPER. 6. PROVIDE OPPOSED BLADE DAMPER FOR REGISTERS.						

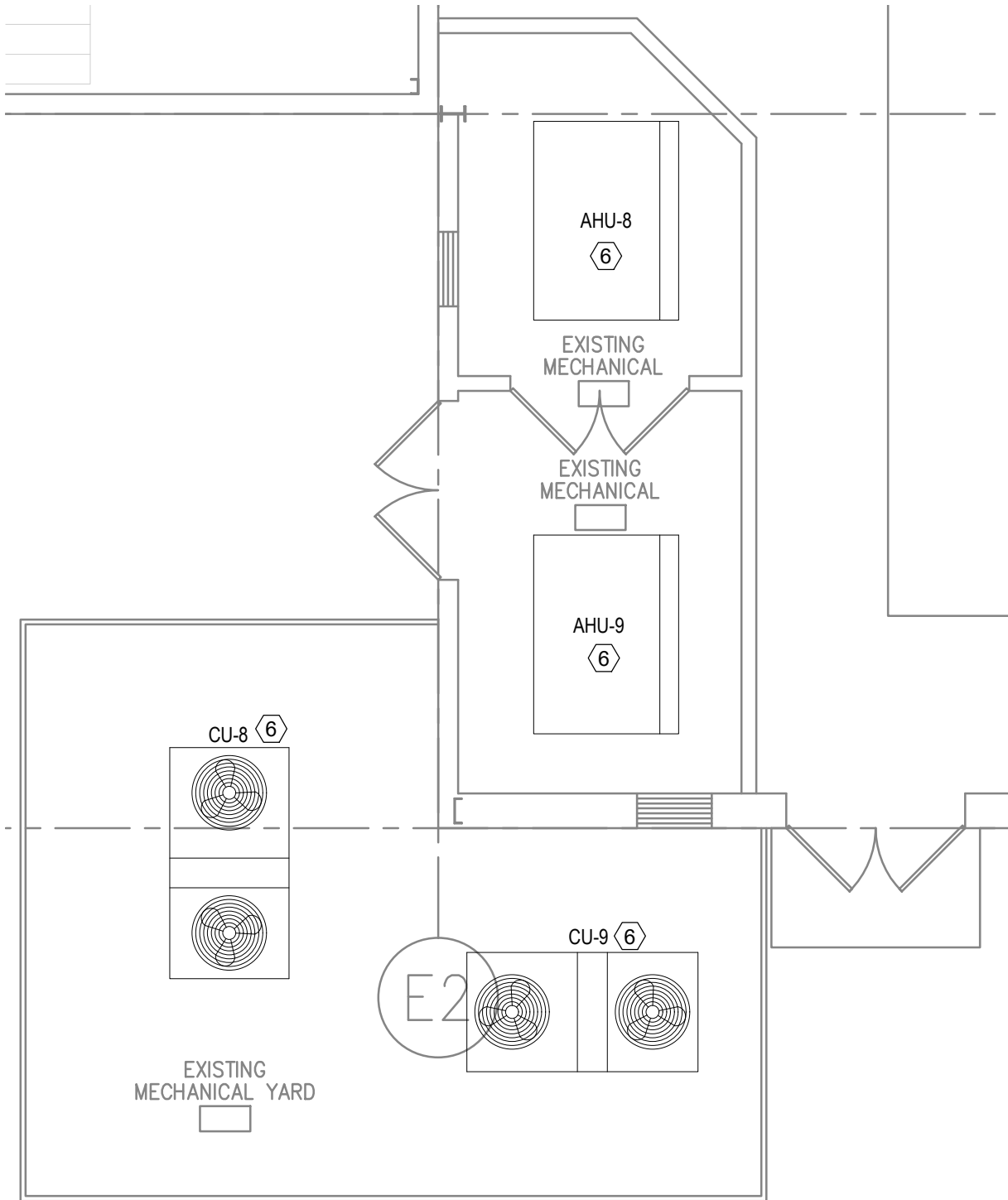
GRAVITY ROOF VENT SCHEDULE						
TYPE	CFM	SERVICE	THROAT AREA	MANUFACTURER	MODEL	NOTES
GRV-1	240	EXHAUST	0.37	GREENHECK	GRSR-8	1,2
GRV-2	100	EXHAUST	0.37	GREENHECK	GRSR-8	1,2
GRV-3	250	EXHAUST	0.37	GREENHECK	GRSR-8	1,2
GIV-1	565	INTAKE	1.0	GREENHECK	GRSI-10	1,2
GIV-2	580	INTAKE	1.0	GREENHECK	GRSI-10	1,2
GIV-3	420	INTAKE	1.0	GREENHECK	GRSI-10	1,2
GIV-4	480	INTAKE	1.0	GREENHECK	GRSI-10	1,2
GIV-5	880	INTAKE	1.0	GREENHECK	GRSI-16	1,2
NOTES:						
1. PROVIDE MANUFACTURER'S ROOF CURB. COORDINATE WITH ROOF TYPE.						
2. PROVIDE INSECT SCREEN.						

GENERAL PLAN NOTES:

1. COORDINATE EXACT LOCATIONS OF MECHANICAL EQUIPMENT WITH ALL DISCIPLINES AND MAINTAIN REQUIRED CLEARANCES.
2. INSTALL FLEXIBLE CONNECTIONS BETWEEN ALL DUCTWORK AND MECHANICAL UNITS.
3. DUCTWORK CONNECTIONS TO EQUIPMENT TO BE SIZE OF UNIT OPENING.
4. PROVIDE BRANCH DUCT CONNECTIONS PER DETAIL ON SHEET M5.1.
5. COORDINATE ALL BRANCH DUCT LOCATIONS WITH STRUCTURAL JOIST OPENINGS.

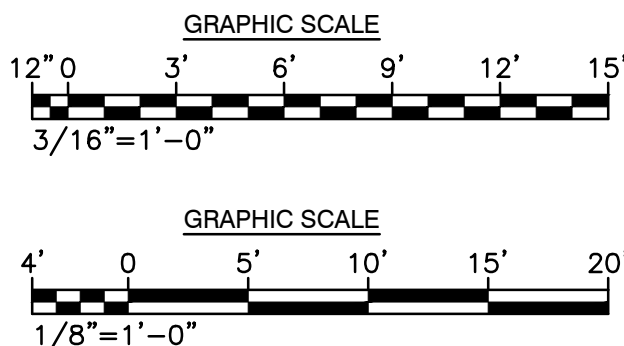
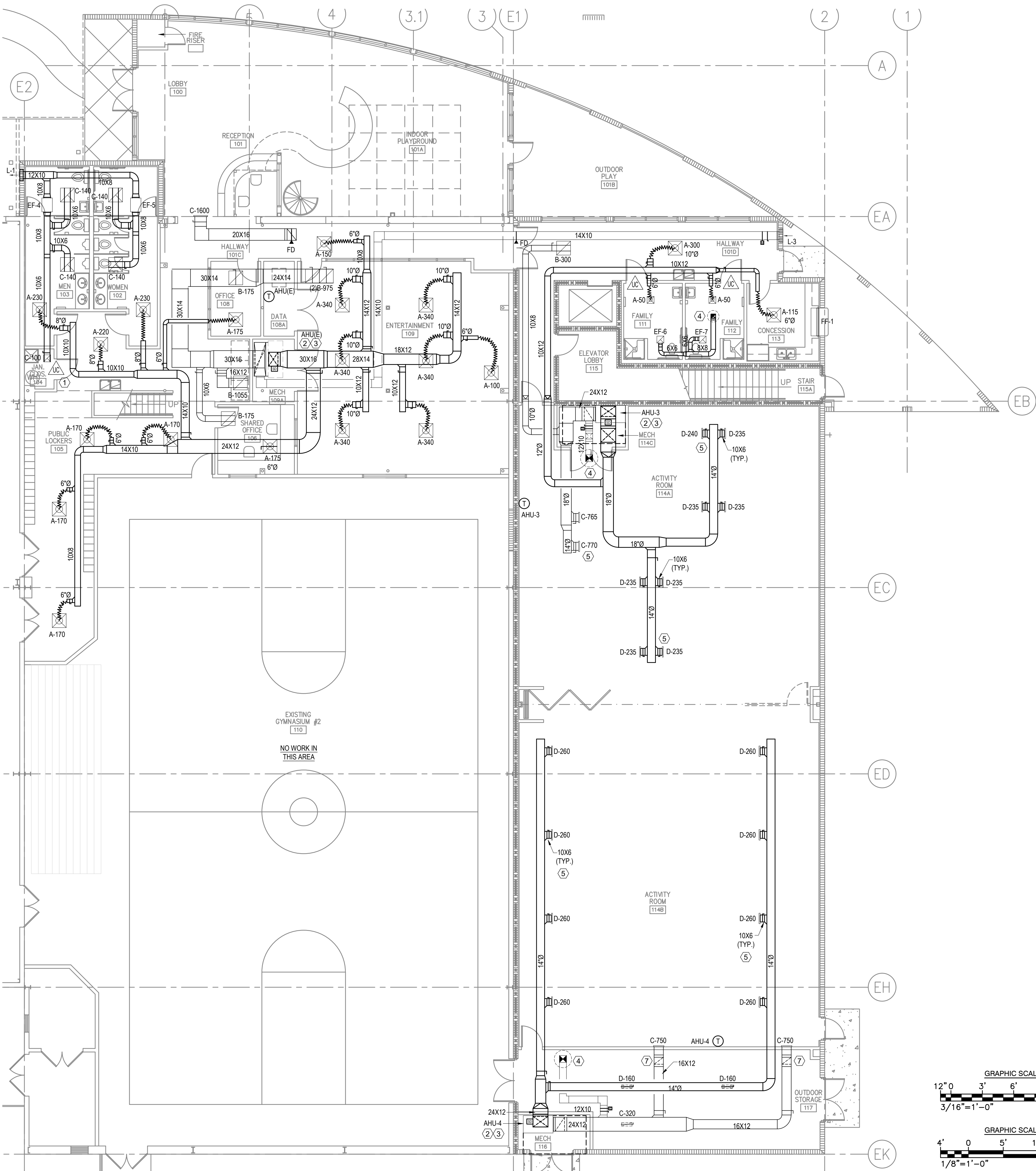
MECHANICAL PLAN KEY NOTES:

- ① UNDERCUT DOOR 1" TO ALLOW FOR TRANSFER OF AIR.
- ② ROUTE CONDENSATE DRAIN PIPING BELOW SLAB TO EXTERIOR DRYWELL.
- ③ ROUTE REFRIGERANT PIPING TO ASSOCIATED CONDENSING UNIT ON THE ROOF. REFER TO REFRIGERANT PIPING SCHEMATIC DETAIL ON MECHANICAL DETAIL SHEET. COORDINATE EXACT LOCATION WITH ARCHITECTURAL PLANS.
- ④ UP TO GRAVITY VENTILATOR ON ROOF.
- ⑤ LOCATE BRANCH TAKE-OFF FOR SIDEWALL REGISTERS AT A 45° ANGLE (TYPICAL).
- ⑥ SEE SCHEDULE NOTES ON M0.2 FOR EQUIPMENT ADD ALTERNATE SPECIFICATIONS.
- ⑦ DROP RETURN DUCT DOWN AND CONNECT TO REGISTER WITH 24" OF FINISHED FLOOR FOR LOW WALL APPLICATION.

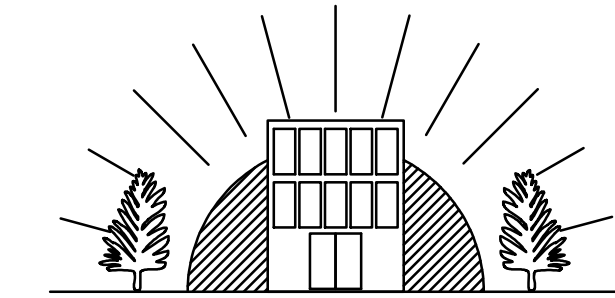


ENLARGED MECHANICAL PLAN – ADD ALTERNATE #1
SCALE: 3/16"=1'-0"

FIRST FLOOR PLAN – MECHANICAL
SCALE: 1/8"=1'-0"



ARCHITECT:



DELOSE O'NEAL ENGINEERING

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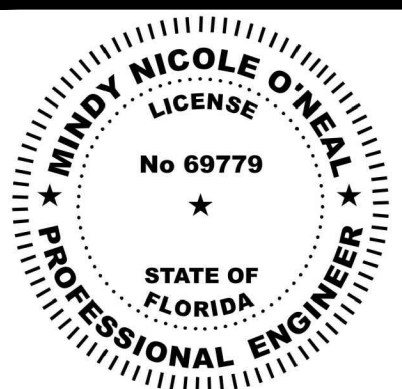
CONSULTANTS:

REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	3.05.2021

DRAWN BY: KMO
DESIGNED BY: KMO
REVIEWED BY: MNO

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

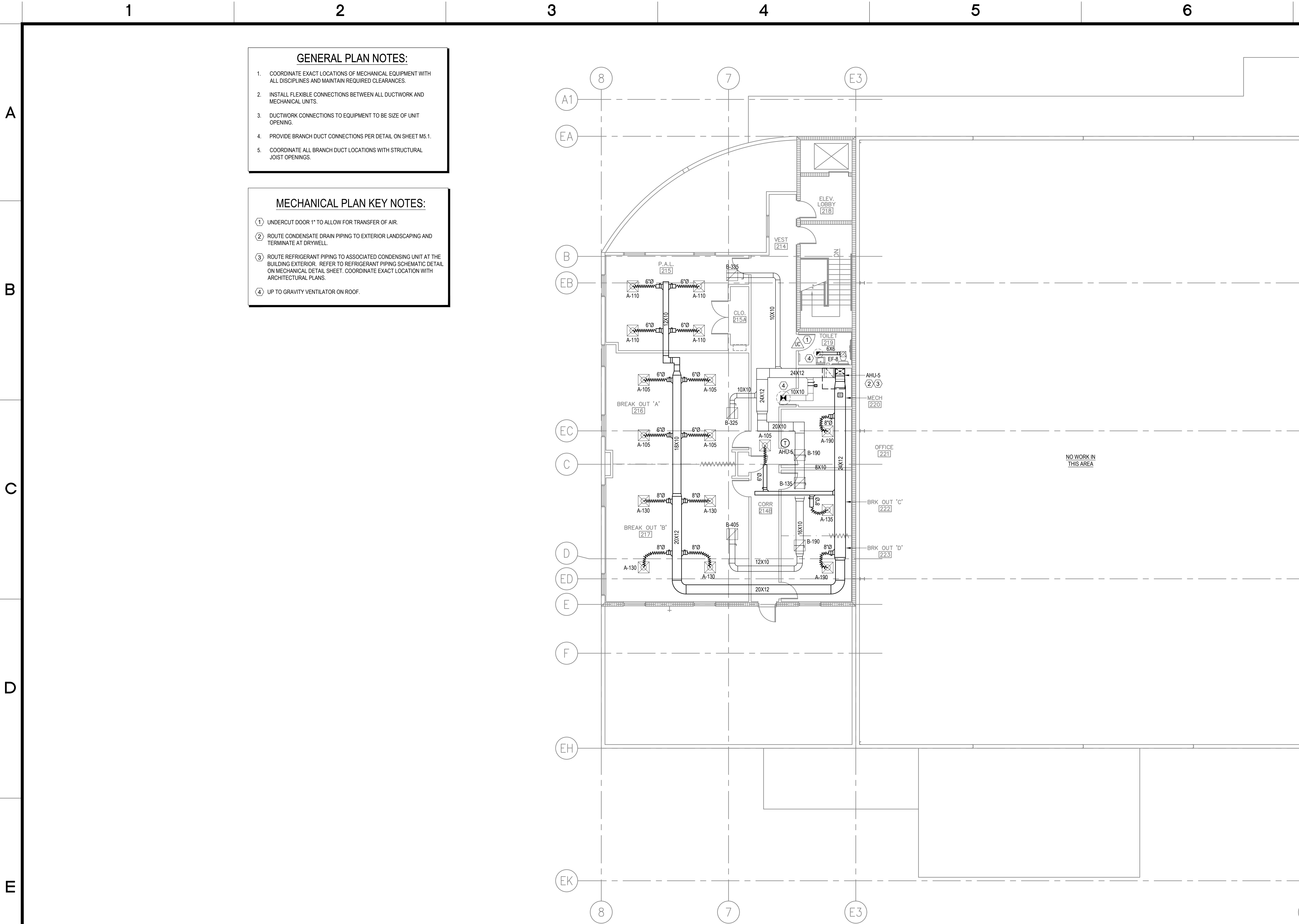
SHEET TITLE
PARTIAL FIRST
FLOOR PLAN – MECHANICAL



MINDY N. O'NEAL
FL# 69779

PROJECT # 020004 DATE: 02.08.2020

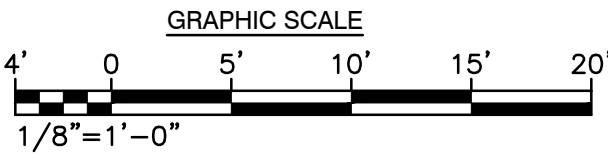
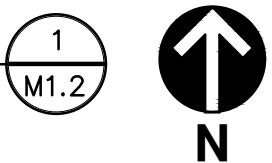
SHEET #
M1.1



- GENERAL PLAN NOTES:**
1. COORDINATE EXACT LOCATIONS OF MECHANICAL EQUIPMENT WITH ALL DISCIPLINES AND MAINTAIN REQUIRED CLEARANCES.
 2. INSTALL FLEXIBLE CONNECTIONS BETWEEN ALL DUCTWORK AND MECHANICAL UNITS.
 3. DUCTWORK CONNECTIONS TO EQUIPMENT TO BE SIZE OF UNIT OPENING.
 4. PROVIDE BRANCH DUCT CONNECTIONS PER DETAIL ON SHEET M5.1.
 5. COORDINATE ALL BRANCH DUCT LOCATIONS WITH STRUCTURAL JOIST OPENINGS.

- MECHANICAL PLAN KEY NOTES:**
- ① UNDERCUT DOOR 1" TO ALLOW FOR TRANSFER OF AIR.
 - ② ROUTE CONDENSATE DRAIN PIPING TO EXTERIOR LANDSCAPING AND TERMINATE AT DRYWELL.
 - ③ ROUTE REFRIGERANT PIPING TO ASSOCIATED CONDENSING UNIT AT THE BUILDING EXTERIOR. REFER TO REFRIGERANT PIPING SCHEMATIC DETAIL ON MECHANICAL DETAIL SHEET. COORDINATE EXACT LOCATION WITH ARCHITECTURAL PLANS.
 - ④ UP TO GRAVITY VENTILATOR ON ROOF.

SECOND FLOOR PLAN – MECHANICAL
SCALE: 1/8"=1'-0"



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EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

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3	FINAL CONSTRUCTION DOCUMENTS	6.08.2020
4	PERMIT SET	11.06.2020
⑤	REVISED PERMIT SET	3.05.2021

DRAWN BY: KMO
DESIGNED BY: KMO
REVIEWED BY: MNO

PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**PARTIAL SECOND
FLOOR PLAN—MECHANICAL**

MINDY NICOLE O'NEAL
LICENSE
No 69779
★
STATE OF FLORIDA
PROFESSIONAL ENGINEER
MINDY N. O'NEAL
FL# 69779

SHEET #
M1.2

PROJECT # 020004 DATE:02.08.2020



GRAPHIC SCALE

24' 0 6' 12' 18' 24' 30'

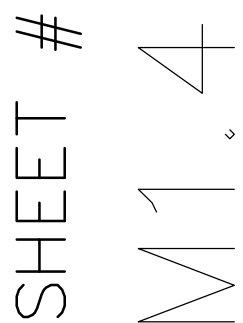
$3/32" = 1'-0"$

CONSULTANTS:

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DESIGNED BY: KMO
REVIEWED BY: MNO

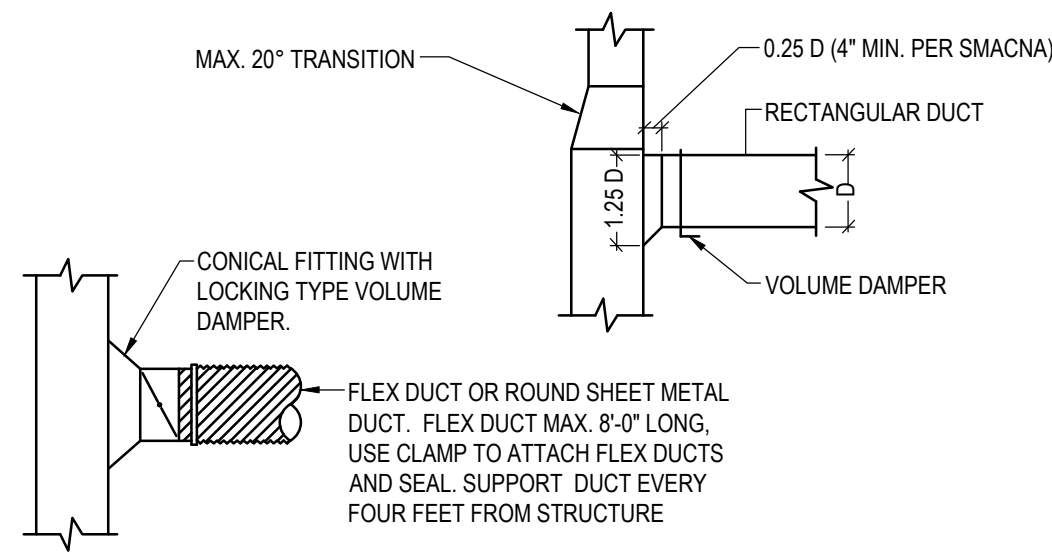
PROJECT TITLE AND ADDRESS
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SHEET TITLE
MECHANICAL
ROOF PLAN

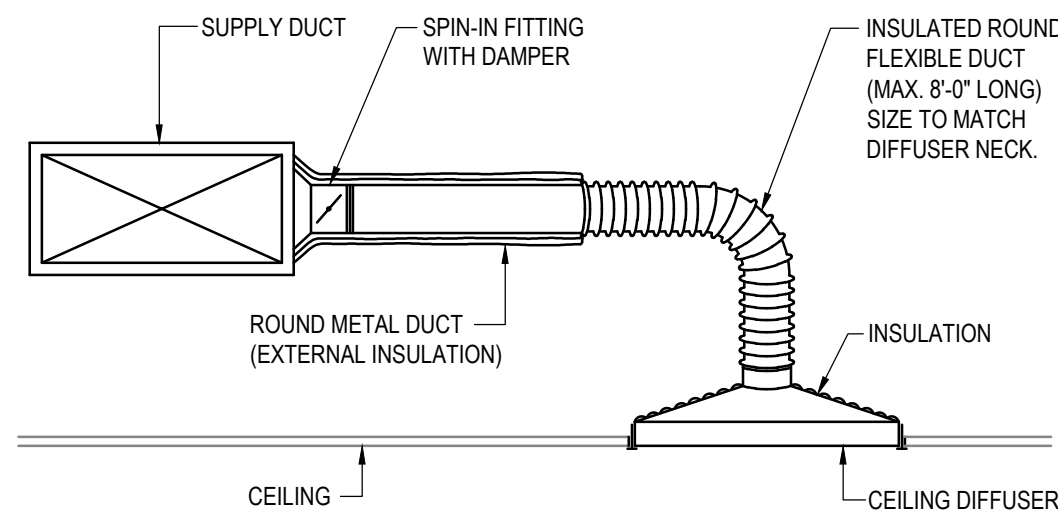


MINDY N. O'NEAL
FL# 69779

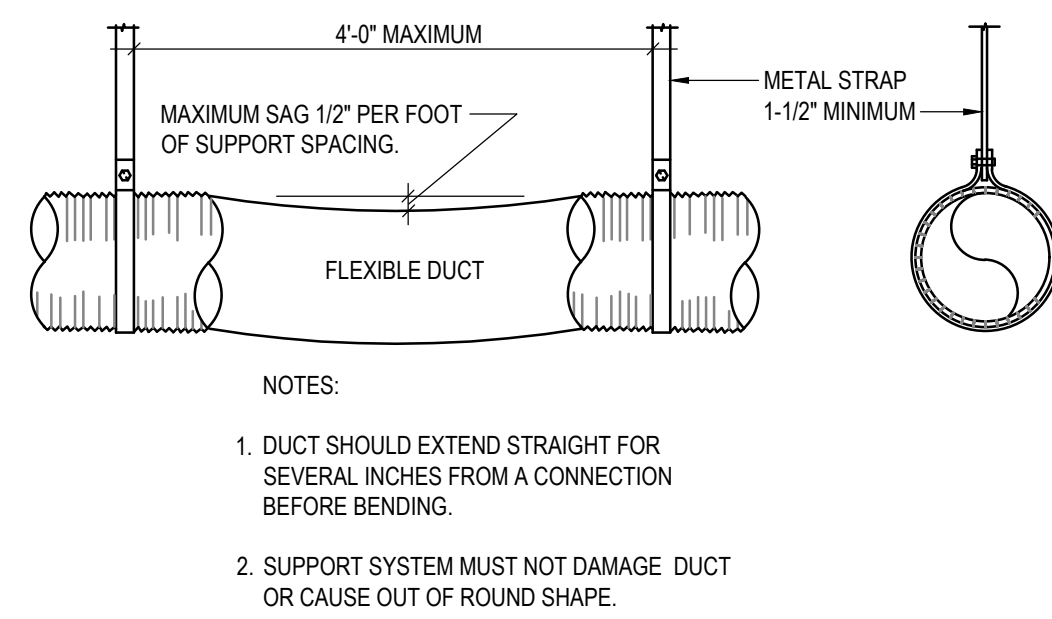
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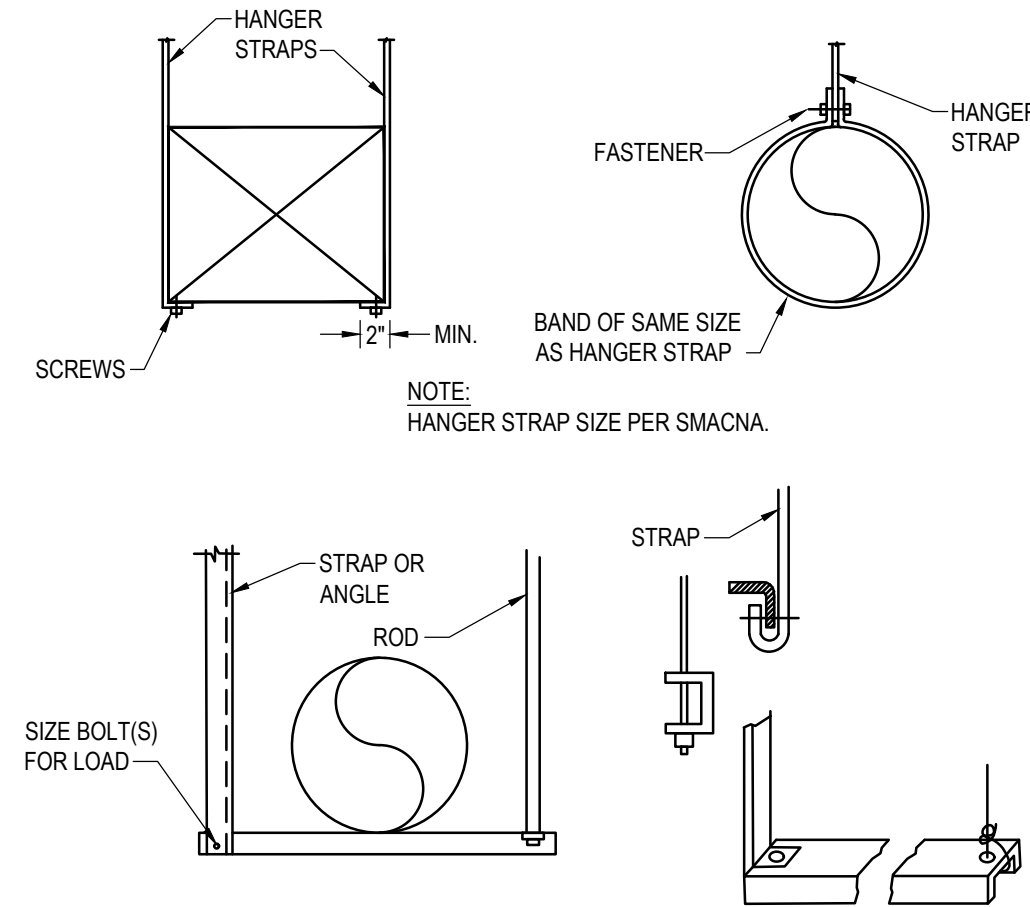
1 Branch Duct Detail
SCALE: NOT TO SCALE



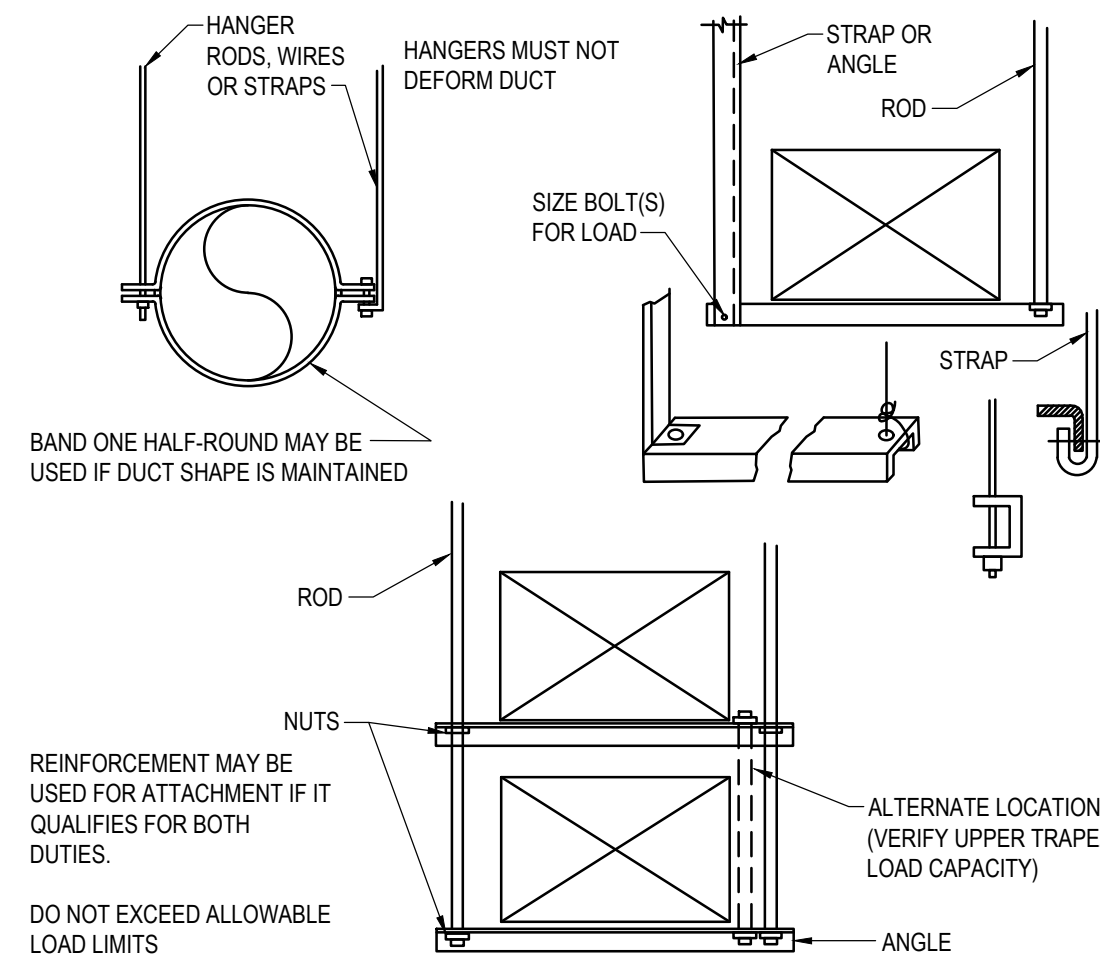
2 Ceiling Diffuser Runout Detail
SCALE: NOT TO SCALE



3 Flex Duct Support Detail
SCALE: NOT TO SCALE



4 Rectangular/Round Duct Hanger Detail
SCALE: NOT TO SCALE



5 Rectangular/Round Duct Hanger Detail
SCALE: NOT TO SCALE

SMACNA TABLE 5-1

MAX. HALF OF DUCT PERIMETER	PAIR AT 8 FT SPACING	
	STRAP	WIRE / ROD
P/2 = 30"	1" x 22 ga.	10 ga. (1.135")
P/2 = 72"	1" x 20 ga.	1/4"
P/2 = 96"	1" x 18 ga.	3/8"
P/2 = 120"	1" x 16 ga.	3/8"
P/2 = 168"	1-1/2" x 16 ga.	1/2"
P/2 = 192"	1-1/2" x 16 ga.	1/2"
P/2 = 108" UP	SPECIAL ANALYSIS REQUIRED	

WHEN STRAPS ARE LAP JOINED USE THESE MINIMUM FASTENERS.
1" x 18, 20, 22 ga. - TWO #10 OR ONE 1/4" BOLT
1" x 16 ga. - TWO 1/4" DIA.
1-1/2" x 16 ga. - TWO 3/8" DIA.
PLACE FASTENERS IN SERIES, NOT SIDE BY SIDE

NOTES:
1. DIMENSIONS OTHER THAN GAGE ARE IN INCHES.
2. TABLE ALLOWS FOR DUCT WEIGHT, 1 LBS/FT INSULATION WEIGHT AND NORMAL REINFORCEMENT AND TRAPEZE WEIGHT, BUT NO EXTERNAL LOADS.
a. FOR CUSTOM DESIGN OF HANGERS, DESIGNERS MAY CONSULT SMACNA'S RECTANGULAR INDUSTRIAL DUCT STANDARDS, THE AISI COLD FORMED STEEL DESIGN MANUAL AND THE AISC STEEL CONSTRUCTION MANUAL.
b. STRAPS ARE GALVANIZED STEEL; OTHER MATERIALS ARE UNCOATED STEEL.
c. ALLOWABLE LOADS FOR P/2 ASSUME THAT DUCTS ARE 16 GA. MAXIMUM, EXCEPT THAT WHEN MAXIMUM DUCT DIMENSION (W) IS OVER 60" THEN P/2 MAXIMUM IS 1.25 W.
d. 12, 10 OR 8 GA. WIRE IS STEEL OF BLACK ANNEALED, BRIGHT BASIC OR GALVANIZED TYPE.

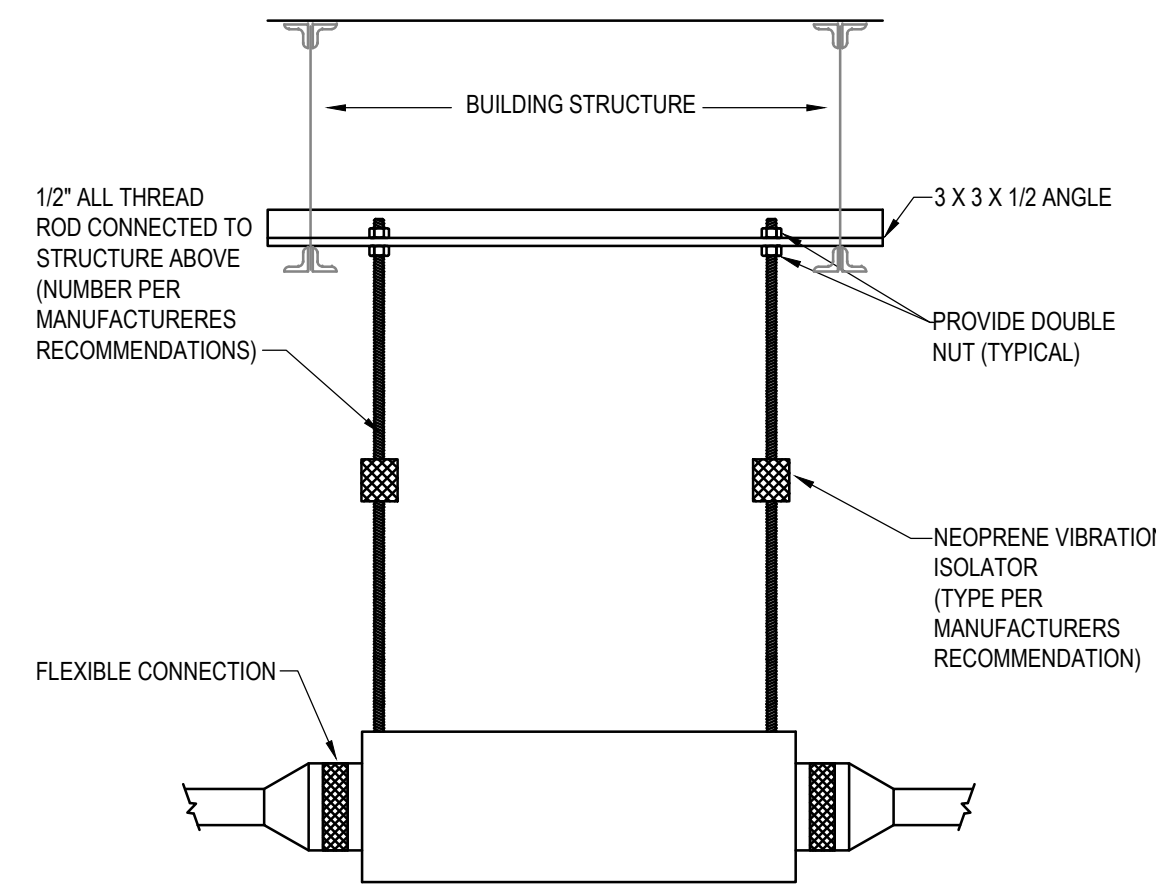
6 Rectangular Duct Hangers
SCALE: NOT TO SCALE

SMACNA TABLE 5-2

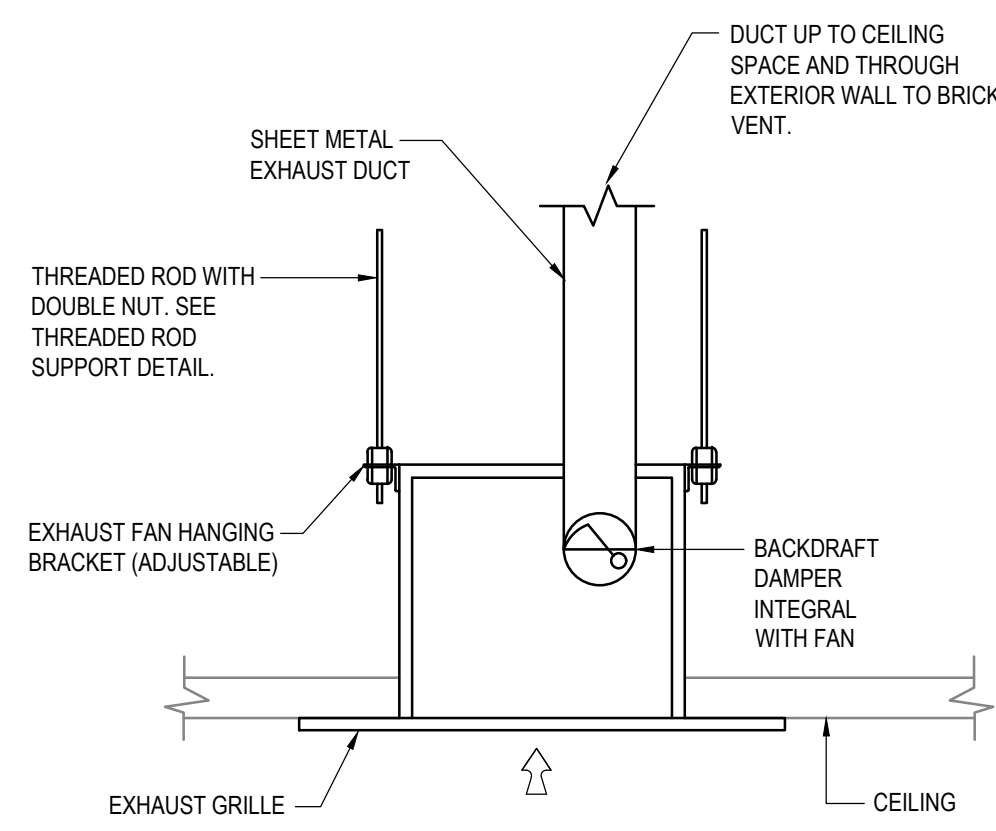
DIA.	MAXIMUM SPACING	ROUND DUCT HANGERS (MIN. SIZE)		
		WIRE DIA.	ROD	STRAP
10" DIA.	12"	(1) 12 ga.	1/4"	1" x 22 ga.
11"-18"	12"	(2) 12 ga. OR (1) 8 ga.	1/4"	1" x 22 ga.
19"-24"	12"	(2) 10 ga.	1/4"	1" x 22 ga.
25"-38"	12"	(2) 8 ga.	3/8"	1" x 20 ga.
37"-50"	12"	-	(2) 3/8"	(2) 1" x 20 ga.
51"-60"	12"	-	(2) 3/8"	(2) 1" x 18 ga.
61"-84"	12"	-	(2) 3/8"	(2) 1" x 16 ga.

NOTES:
1. STRAPS ARE GALVANIZED STEEL; RODS ARE UNCOATED OR GALVANIZED STEEL; WIRE IS BLACK ANNEALED, BRIGHT BASIC, OR GALVANIZED STEEL. ALL ARE ALTERNATIVES.
a. TABLE ALLOWS FOR CONVENTIONAL WALL THICKNESS, AND JOINT SYSTEMS PLUS ONE LBS/FT INSULATION WEIGHT. IF HEAVIER DUCTS ARE TO BE INSTALLED, ADJUST HANGER SIZES TO BE WITHIN THEIR LOAD LIMITS. HANGER SPACING MAY BE ADJUSTED BY SPECIAL ANALYSIS.
b. DESIGNERS FOR INDUSTRIAL GRADE SUPPORTS, INCLUDING SADDLES, SINGLE LOAD TRAPEZE LOADS, LONGER SPANS AND FLANGE JOINT LOADS, SEE SMACNA'S ROUND INDUSTRIAL DUCT CONSTRUCTION STANDARDS.

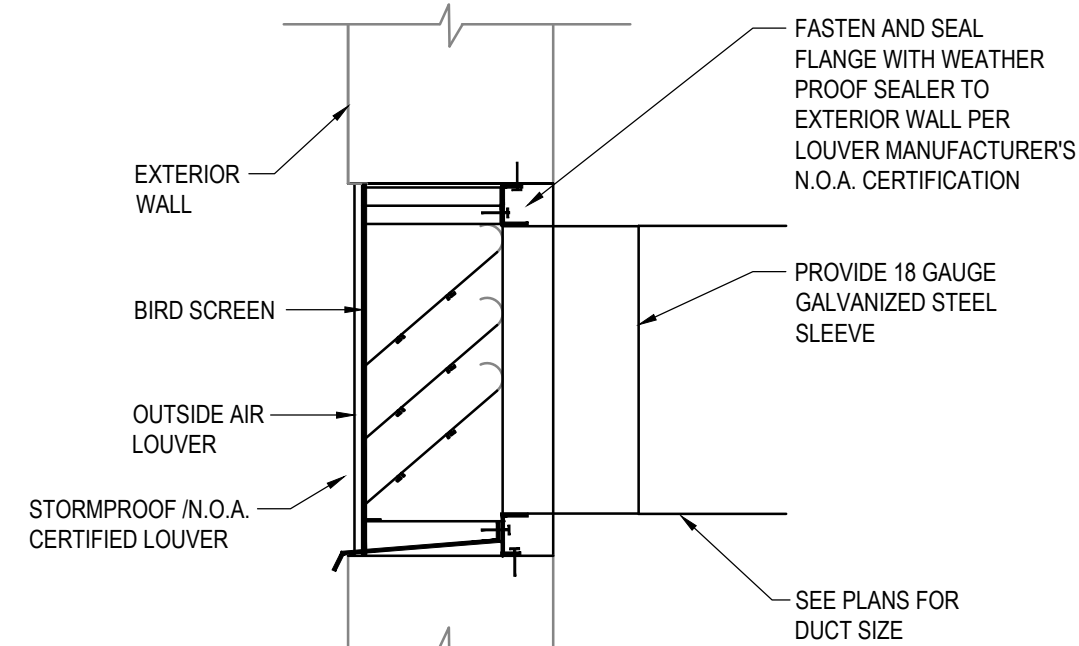
7 Round Duct Hangers
SCALE: NOT TO SCALE



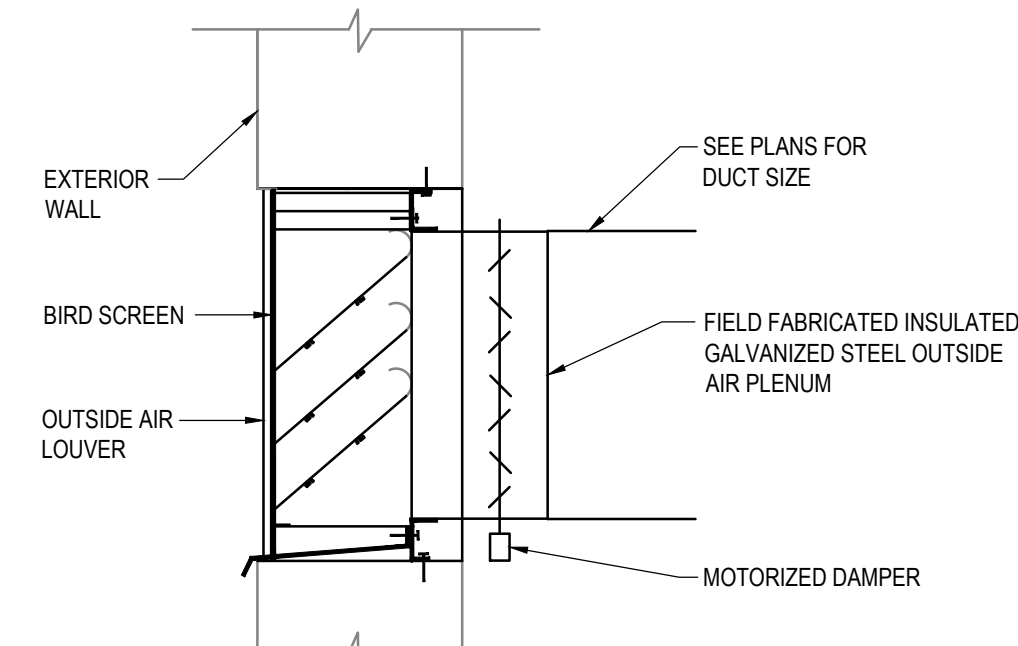
8 Inline Fan Support Detail
SCALE: NOT TO SCALE



9 Ceiling Mounted Exhaust Fan
SCALE: NOT TO SCALE



10 Exhaust Louver Detail
SCALE: NOT TO SCALE



11 Outside Air Louver Detail
SCALE: NOT TO SCALE

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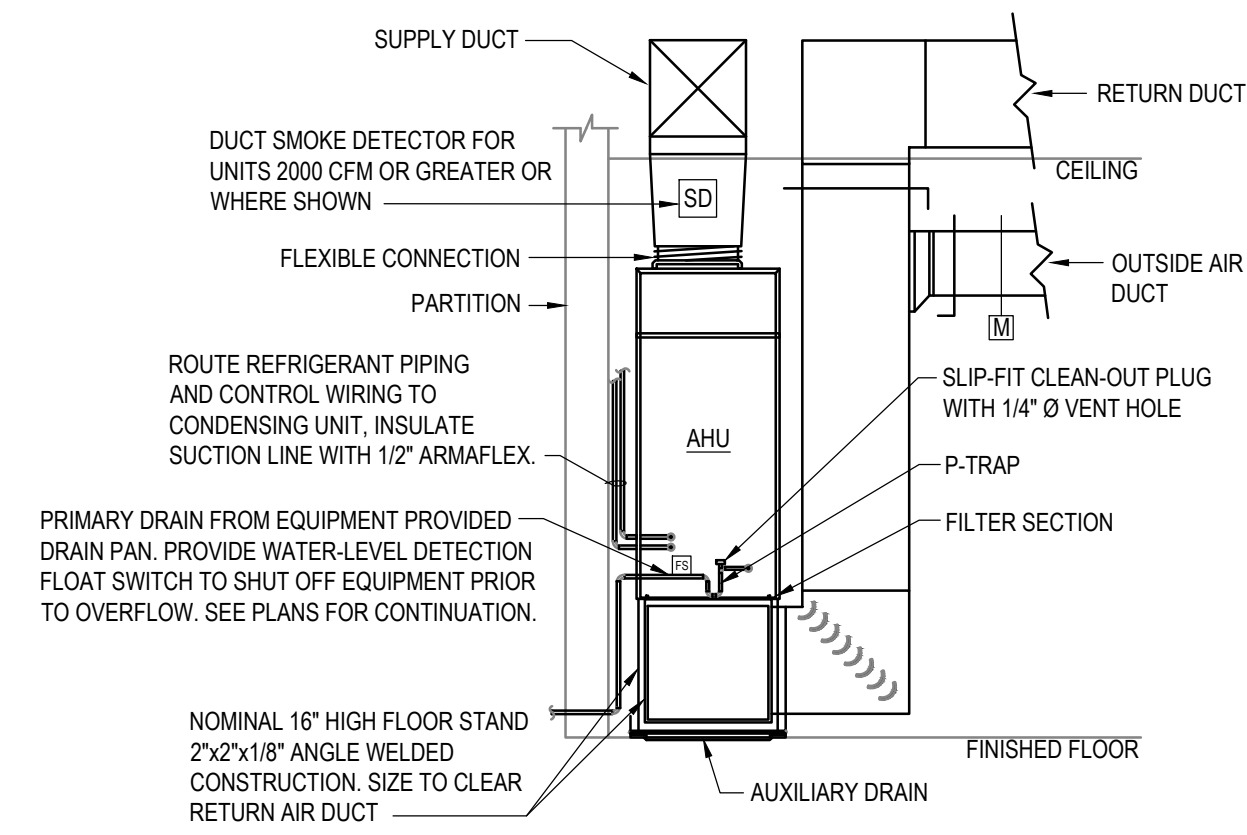
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SHEET TITLE
**MECHANICAL
DETAILS**

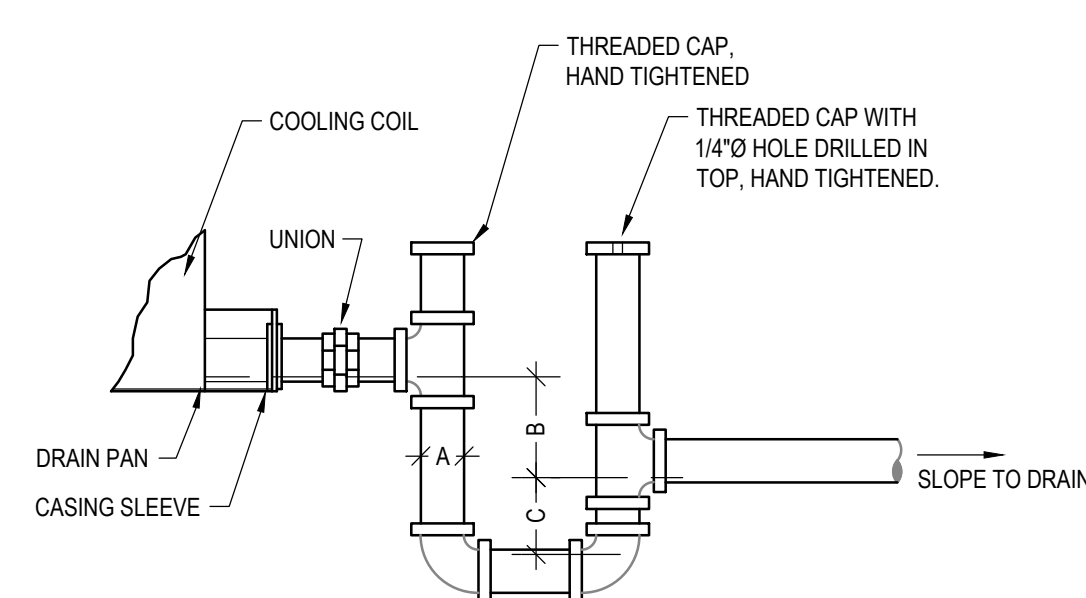
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No 69779
STATE OF FLORIDA
PROFESSIONAL ENGINEER
MINDY N. O'NEAL
FL# 69779

SHEET #
M5.1

PROJECT # 020004 DATE: 02.08.2020



1 Vertical DX AHU Detail
SCALE: NOT TO SCALE

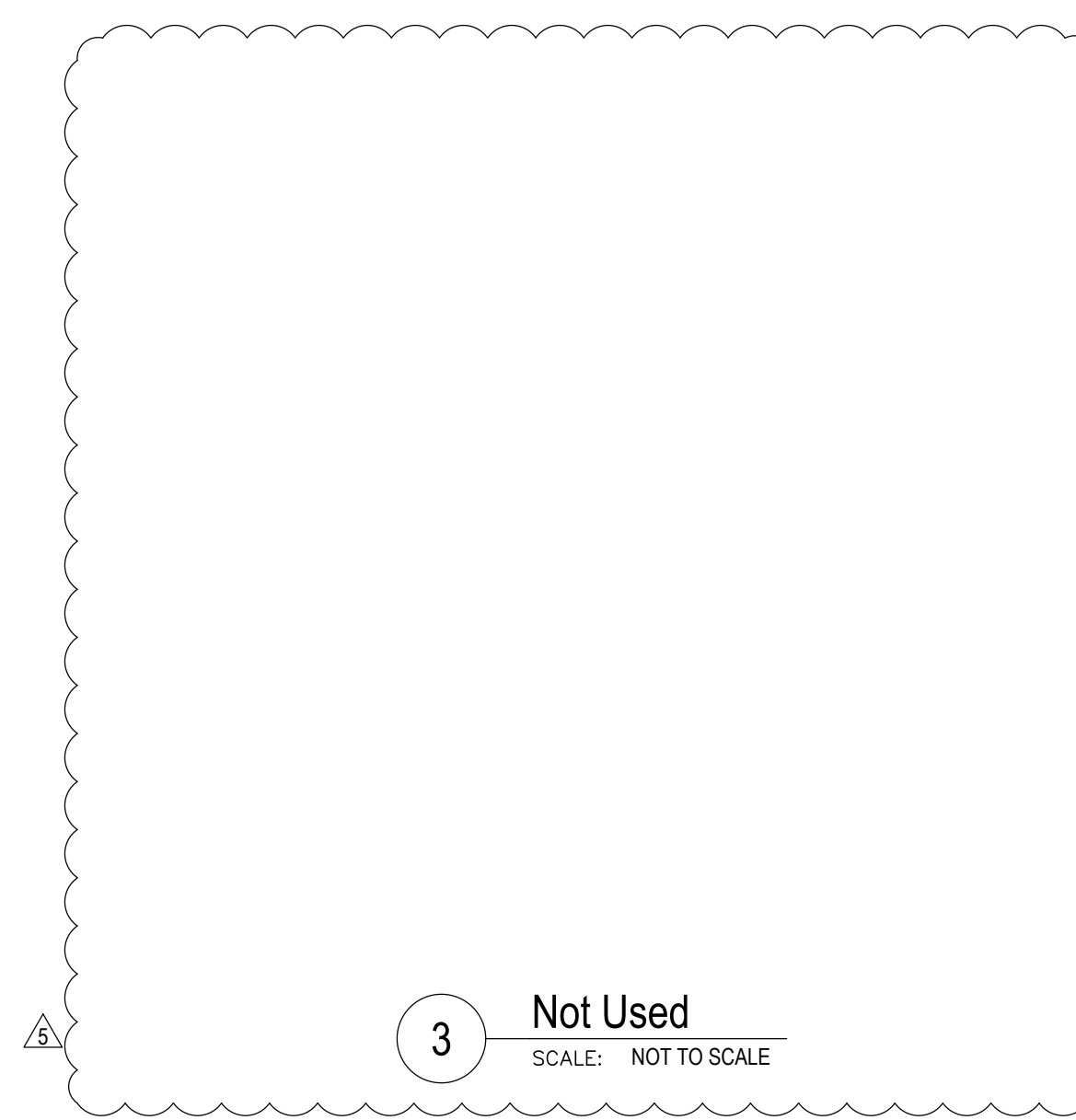


CONDENSATE DRAIN PIPING DIMENSIONS:

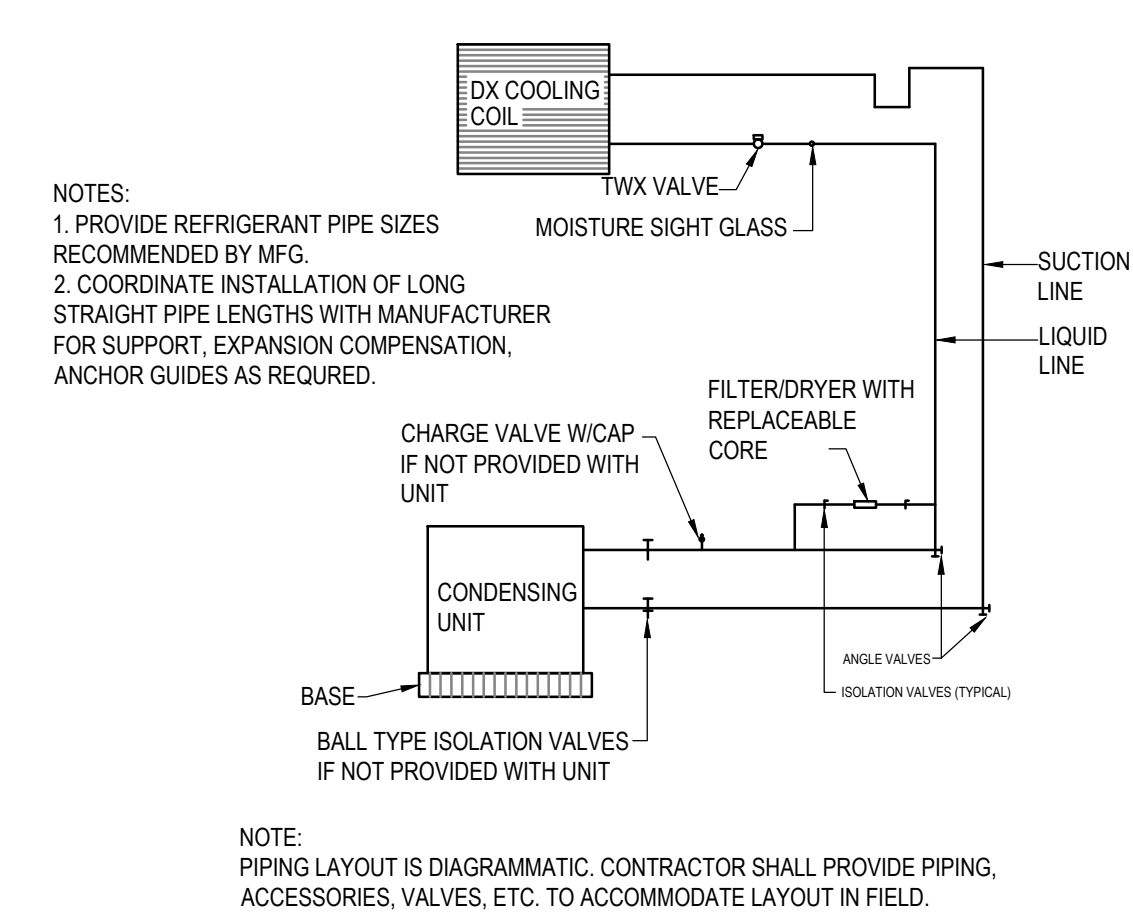
= FULL SIZE OF UNIT DRAIN CONNECTION
≥ 1-1/2 TIMES FAN SUCTION STATIC PRESSURE
≥ FAN DISCHARGE STATIC PRESSURE PLUS 1/2 INCH

COORDINATE MOUNTING/CURB HEIGHT AS REQUIRED
TO PROVIDE PROPER CONDENSATE DRAINAGE.

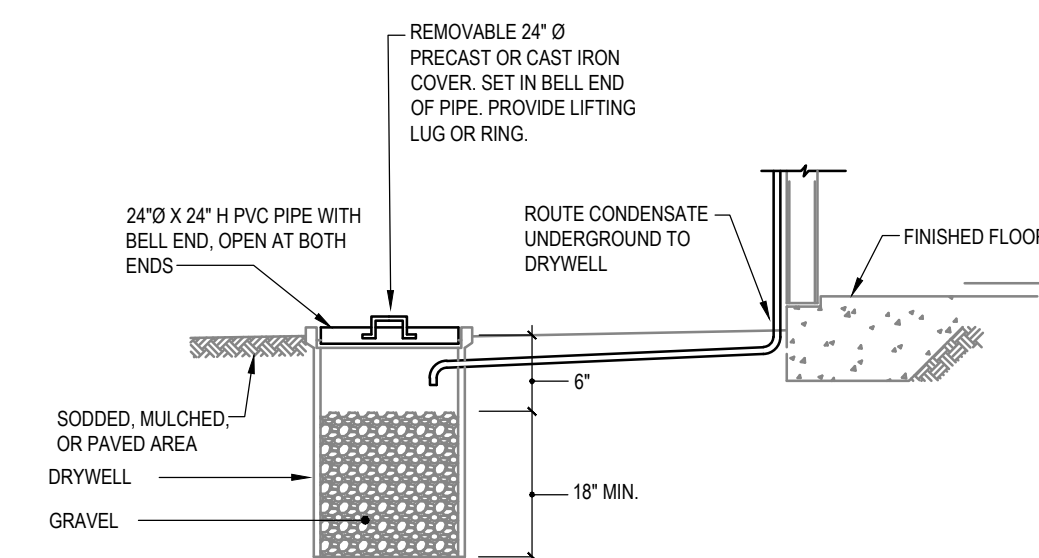
2 AHU Condensate Drain Trap Detail
SCALE: NOT TO SCALE



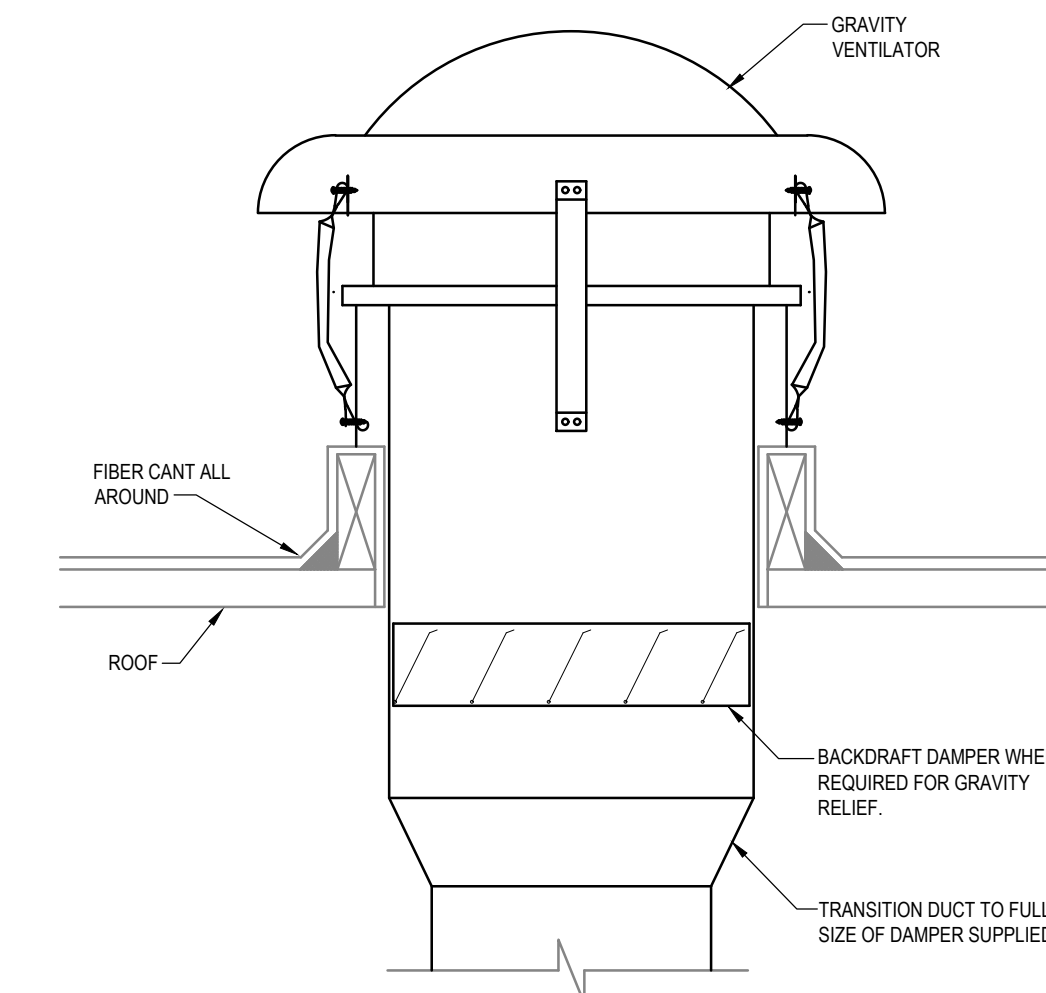
3 Not Used
SCALE: NOT TO SCALE



4 Refrigerant Piping Schematic Detail

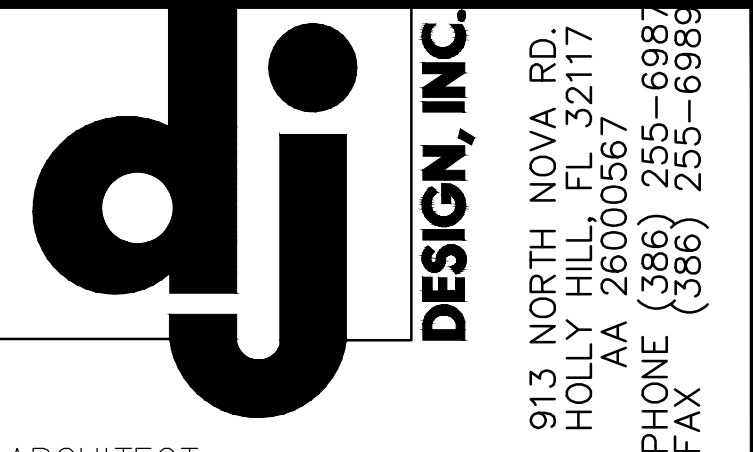


5 Drywell Condensate Disposal Detail
SCALE: NOT TO SCALE

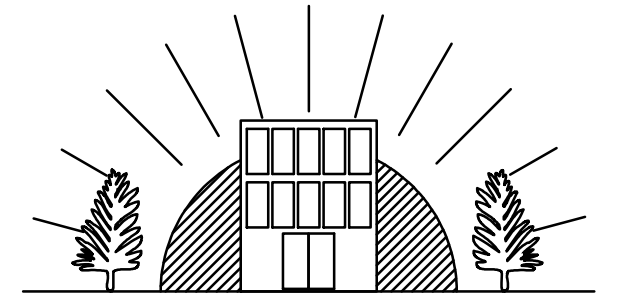


NOTE:
CONTRACTOR TO PROVIDE ENGINEERED TIE-DOWN SOLUTION IN ACCORDANCE WITH SECTION 301.15 OF THE 2017 FLORIDA BUILDING CODE- MECHANICAL, SIXTH EDITION. PROVIDE A SIGNED AND SEALED CONNECTION DESIGN PER MANUFACTURERS SPECIFICATIONS PRIOR TO INSTALLATION. (3) COPIES OF PRODUCT APPROVAL INFORMATION TO BE SUPPLIED FOR MANUFACTURERS ENGINEERED TIE-DOWN SYSTEM.

6 Gravity Ventilator - Roof Curb Mounted
SCALE: NOT TO SCALE



ARCHITECT:

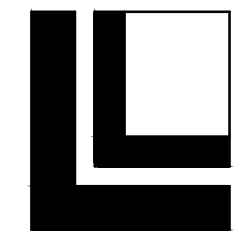


DELOSE O'NEAL ENGINEERING

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CONSULTANTS:



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FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

[illegible]

DRAWN BY: KMO
DESIGNED BY: KMO
REVIEWED BY: MNO

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
MECHANICAL
DETAILS



MINDY N. O'NEAL
FL# 69779

SHEET #
V5.2

PROJECT #	020004	DATE:02.08.2020
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A

B

C

D

E

DRAWING INDEX	
SHEET NUMBER	TITLE
P0.1	Plumbing General Information
P0.2	Plumbing Schedules
P1.0	Partial First Floor Sanitary Plan
P1.1	Partial First Floor Sanitary Plan
P1.2	Partial Second Floor Sanitary Plan
P1.3	Partial Second Floor Sanitary Plan
P1.4	Plumbing Roof Plan
P2.0	Partial First Floor Domestic Water Plan
P2.1	Partial First Floor Domestic Water Plan
P2.2	Partial Second Floor Domestic Water Plan
P2.3	Partial Second Floor Domestic Water Plan
P5.1	Plumbing Details
P6.1	Sanitary Riser Diagrams
P6.2	Rainwater Riser Diagrams
P7.1	Domestic Water Riser Diagrams

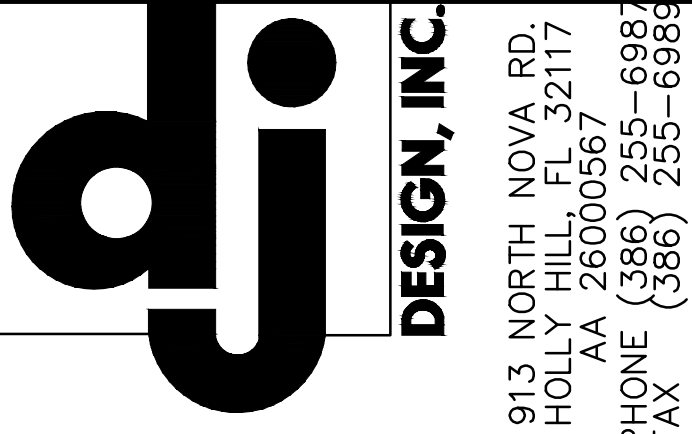
SYMBOLS AND ABBREVIATIONS		
DESCRIPTION	ABBR.	SYMBOL
SANITARY PIPE ABOVE GRADE	SAN	_____
SANITARY PIPE BELOW GRADE	SAN	_____
FORCE MAIN ABOVE GRADE	FM	_____ FM _____
RAINWATER PIPE	RW	_____ RW _____
STORM WATER BELOW	ST	_____ ST _____
FILTERED WATER	FW	_____ FW _____
SOFT WATER	SW	_____ SW _____
COLD WATER PIPE	CW	_____ CW _____
HOT WATER PIPE	HW	_____ HW _____
HOT WATER RETURN	HWR	_____ HWR _____
CONDENSATE PIPE	C	_____ C _____
VENT PIPE	V	_____ V _____
GAS (NATURAL) PIPE	G	_____ G _____
CLEANOUT	CO	_____ CO _____
EXTERIOR CLEANOUT	ECO	_____ ECO _____
FLOOR CLEANOUT	FCO	_____ FCO _____
BACKWATER VALVE	BWV	_____ BWV _____
VENT THRU ROOF	VTR	_____ VTR _____
DIRECTION OF FLOW	-	_____ - _____
CAP	-	_____ CAP _____
TEE UP	-	_____ TEE UP _____
TEE DOWN	-	_____ TEE DOWN _____
ELBOW UP	-	_____ ELBOW UP _____
ELBOW DOWN	-	_____ ELBOW DOWN _____
REVISION REFERENCE	-	_____ REVISION REFERENCE _____
HOSE BIBB	-	_____ HOSE BIBB _____
CHECK VALVE	-	_____ CHECK VALVE _____
FLOOR DRAIN	-	_____ FLOOR DRAIN _____
FLOOR DRAIN OR FLOOR SINK	-	_____ FLOOR DRAIN OR FLOOR SINK _____
SHUT-OFF VALVE	-	_____ SHUT-OFF VALVE _____
BALANCING VALVE	-	_____ BALANCING VALVE _____
UNION	-	_____ UNION _____
RECIRCULATING PUMP	-	_____ RECIRCULATING PUMP _____
ROOF DRAIN	-	_____ ROOF DRAIN _____
CONNECT TO EXISTING	-	_____ CONNECT TO EXISTING _____
EXISTING	-	_____ EXISTING _____
ACCESS DOOR/PANEL	-	_____ ACCESS DOOR/PANEL _____
*SOME SYMBOLS SHOWN MAY NOT PERTAIN TO THIS PROJECT		

PLUMBING GENERAL NOTES	
1. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES AND GOVERNING AUTHORITIES INCLUDING: FLORIDA BUILDING CODE SIXTH EDITION - 2017, FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING, FBC SIXTH EDITION 2017- ENERGY CONSERVATION, FFPC SIXTH EDITION- 2017.	22. FURNISH AND INSTALL HOSE BIBBS AND/OR WALL HYDRANTS 24" ABOVE FINISHED GRADE/FLOOR (UNLESS OTHERWISE NOTED) AND PROVIDE VACUUM BREAKERS.
2. ALL SANITARY PIPING 2-1/2" OR LESS SHALL HAVE A 1/4" PER FOOT SLOPE. ALL SANITARY PIPING 3" OR LARGER SHALL HAVE A 1/8" PER FOOT SLOPE UNLESS OTHERWISE NOTED. ALL STORM WATER PIPING 2-1/2" OR LESS SHALL HAVE A 1/4" PER FOOT MINIMUM HORIZONTAL SLOPE. ALL STORM WATER PIPING 3" OR LARGER SHALL HAVE A 1/8" PER FOOT MINIMUM HORIZONTAL SLOPE UNLESS OTHERWISE INDICATED.	23. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF ROOF DRAINS, PLUMBING FIXTURE MOUNTING HEIGHTS AND DIMENSIONS.
3. VALVES AND FITTINGS SHALL BE OF SAME SIZE OF PIPE ON WHICH THEY ARE LOCATED, UNLESS OTHERWISE INDICATED ON DRAWINGS.	24. CONTRACTOR SHALL VERIFY INVERT ELEVATIONS OF EXISTING SEWERS IN WHICH NEW SEWER LINES ARE TO BE CONNECTED PRIOR TO STARTING WORK.
4. INSTALL WATER HAMMER SHOCK ARRESTORS AT EACH FIXTURE OR BATTERY OF FIXTURES WHERE REQUIRED. ARRESTORS SHALL BE FACTORY FABRICATED. INSTALL ARRESTORS AND SIZE PER PLUMBING AND DRAINAGE INSTITUTE STANDARD P.D.I. WH-201. ACCEPTABLE MANUFACTURERS: JOSAM, WATTS AND SIOUX CHIEF. AIR CHAMBERS SHALL NOT BE CONSIDERED AN EQUAL TO WATER ARRESTORS AS SPECIFIED.	25. CONTRACTOR SHALL INSTALL DIELECTRIC UNIONS AT CONNECTIONS OF DISSIMILAR METALS.
5. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING FIRE RATING AND WEATHERPROOFING INTEGRITY OF ALL PIPE PENETRATIONS.	26. CONTRACTOR SHALL ROUGH-IN ALL WASTE AND SUPPLIES TO SPECIAL EQUIPMENT ACCORDING TO MANUFACTURER'S SHOP DRAWINGS AND MAKE FINAL CONNECTIONS AS NOTED. ALL SUPPLIES SHALL BE VALVED. INSTALL VACUUM BREAKERS WHERE REQUIRED BY CODE.
6. ALL WATER SUPPLY AND SANITARY LINES SHALL RUN AS CLOSE TO PLANS AS POSSIBLE WITH NO CHANGES IN SIZING.	27. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS (INCLUDING PIPE ROUTING AND EQUIPMENT LOCATIONS) TO ARCHITECT/ENGINEER FOR REVIEW PRIOR TO THE INSTALLATION OR PURCHASING OF ANY PIPING AND/OR EQUIPMENT.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY SUPPORTING DEVICES FOR FIXTURES.	28. PROVIDE REDUCED PRESSURE BACKFLOW PREVENTERS FOR DOMESTIC WATER SUPPLY CONNECTIONS AS REQUIRED BY CODE.
8. CHANGES IN THE DIRECTION OF SANITARY AND STORM DRAINAGE PIPING SHALL NOT BE MADE WITH FITTINGS WHICH WILL CAUSE EXCESSIVE REDUCTION IN THE VELOCITY OF FLOW OR CREATE ANY OTHER ADVERSE EFFECT. I.E.: USE OF SANITARY TEE IN A HORIZONTAL CONNECTION, USE OF A DOUBLE SANITARY TEE IN A VERTICAL STACK, USE OF SHORT RADIUS FITTINGS FOR BRANCH TO HOUSE DRAIN OR STACK CONNECTION.	29. ALL BELOW GRADE/SLAB COPPER PIPE SHALL BE PLACED WITHIN COPPER PIPE SLEEVE (10 MIL) POLYETHYLENE PLASTIC SLEEVING. EXTEND SLEEVING ABOVE GRADE/SLAB.
9. CONTRACTOR SHALL GIVE 24 HOURS NOTICE TO APPLICABLE UTILITY COMPANY PRIOR TO PERFORMING WORK INVOLVING UTILITIES.	30. CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF FLOOR DRAINS LOCATED IN TOILET ROOMS. PLUMBING CONTRACTOR SHALL COORDINATE EXACT LOCATION OF FLOOR DRAINS SERVING MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION.
10. WHERE SANITARY SEWER LINES CROSS UNDERGROUND WATER SUPPLY LINES THE INSTALLATION SHALL COMPLY WITH THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING.	31. PRESSURE REDUCING VALVES SHALL BE INSTALLED ON BRANCH LINES SERVING FIXTURES AND/OR EQUIPMENT WHEN THE PRESSURE IN THE LINE EXCEEDS 80 P.S.I.
11. ALL FLOOR DRAINS SHALL BE PROVIDED WITH A TRAP PRIMER VALVE AND FITTINGS UNLESS NOTED OTHERWISE.	32. COORDINATE ROUTING OF ALL PLUMBING SYSTEMS TO AVOID CONFLICTS WITH OTHER DISCIPLINES WITHIN INTERSTITIAL SPACE AND ROUTE TIGHT TO STRUCTURE WHERE POSSIBLE. PIPING SHALL NOT ENTER OR PASS THROUGH ELECTRICAL AND COMMUNICATION ROOMS.
12. THE PLUMBING CONTRACTOR MAY BE REQUIRED TO DROP PIPE OUTSIDE OF BUILDING TO REQUIRED DEPTH TO PROVIDE CONNECTION TO AREA DEVELOPMENT UTILITY STUB. ALL DROPS IN DEPTH SHALL BE MADE WITH THE USE OF 45° FITTINGS.	33. IF THE INTENT OF THE DRAWINGS AND/OR SPECIFICATIONS IS UNCLEAR OR HAS MORE THAN ONE INTERPRETATION, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER IN WRITING BEFORE THE SUBMISSION OF BIDS. THE ARCHITECT/ENGINEER SHALL MAKE CORRECTIONS AND/OR PROVIDE EXPLANATION IN WRITING.
13. ROUTE ALL PIPING CONCEALED ABOVE CEILINGS, WITHIN WALLS, OR IN CHASES. EXPOSED PIPING SHALL BE SLOPED AND PAINTED TO MATCH ARCHITECTURAL FINISHES. PIPING IN MECHANICAL ROOMS MAY BE EXPOSED.	34. PLANS AND SPECIFICATIONS ARE INTENDED AS A GENERAL DESCRIPTION OF THE WORK TO BE PERFORMED. ALL ITEMS NOT SPECIFICALLY MENTIONED OR SHOWN, BUT NECESSARY FOR THE COMPLETION OF THE INSTALLATION, SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR. THE CONTRACTOR SHALL ACQUAINT HIMSELF WITH THE MECHANICAL, ARCHITECTURAL, STRUCTURAL AND ELECTRICAL PLANS PRIOR TO SUBMITTING HIS FINAL BID. NO ADDITIONAL COMPENSATION WILL BE ALLOWED DUE TO CONTRACTOR'S FAILURE TO FAMILIARIZE HIMSELF WITH THE PLANS.
14. ALL PENETRATIONS OF RATED WALLS, FLOORS, CEILINGS, ETC., SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714 OF THE FBC SIXTH EDITION - 2017 TO MAINTAIN RATINGS. REFER TO ARCHITECTURAL DRAWINGS FOR APPLICABLE UL STANDARDS AND LOCATIONS OF RATED WALLS, CEILINGS, FLOORS, ETC.	35. THE CONTRACTOR SHALL BASE HIS PROPOSAL UPON THE EQUIPMENT AS SCHEDULED OR SPECIFIED, USING THE MANUFACTURERS AND EQUIPMENT SPECIFIED ON THE DRAWINGS. IF MORE THAN ONE MANUFACTURER IS SPECIFIED FOR ONE ITEM, ANY ONE OF THE MANUFACTURERS LISTED MAY BE USED IN THIS CONTRACTOR'S PROPOSAL. IF THIS CONTRACTOR WISHES TO USE EQUIPMENT NOT SPECIFIED, HE MUST AT THE TIME OF BIDDING SUBMIT SEPARATELY ON LETTERHEAD STATIONARY OF THE BIDDER, THE EQUIPMENT HE WOULD SUBSTITUTE AND THE COST TO BE ADDED OR TO BE DEDUCTED FROM HIS PROPOSAL. CONTRACTOR'S PROPOSED SUBSTITUTES SHALL BE SUBMITTED TO ARCHITECT AND APPROVED BY OWNER.
15. ALL WATER PIPING INSTALLED IN EXTERIOR WALLS SHALL BE PLACED ON THE INTERIOR SIDE OF THE WALL. THE WALL INSULATION SHALL BE PLACED ON THE EXTERIOR SIDE OF THE PIPE.	36. THE CONTRACTOR IS EXPECTED TO ORDER ALL MATERIALS IN SUFFICIENT TIME TO AVOID DELAYING THE COMPLETION OF THE PROJECT. DELAY IN DELIVERY WILL NOT BE CONSIDERED A JUSTIFIABLE REASON FOR SUBMISSION OF SUBSTITUTE MATERIALS.
16. SEE RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.	37. DO NOT PENETRATE WALL FOOTINGS WITH PIPING. COORDINATE PENETRATION LOCATION WITH GENERAL CONTRACTOR. PIPE PENETRATING A BEARING WALL OR FOOTING MUST BE SLEEVED AND LOCATION APPROVED BY STRUCTURAL ENGINEER.
17. COLD AND HOT WATER PIPING SHALL BE CHLORINATED POLYVINYL CHLORIDE (CPVC) SCHEDULE 40 PLASTIC PIPE AND TUBING (ASTM F441) WITH CPVC SCHEDULE 40 FITTINGS (ASTM F438) SOCKET TYPE. DISINFECT WATER PIPING AFTER PRESSURE TEST. DISINFECTION PROCEDURE SHALL COMPLY WITH THE LOCAL HEALTH AUTHORITY, LOCAL WATER PURVEYOR, FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING, SECTION 610 DISINFECTION OF POTABLE WATER SYSTEMS.	38. REFER TO PLANS FOR VENT THRU ROOF (VTR) PIPE SIZES AND LOCATIONS. LOCATE VTR A MINIMUM OF 10' OF HORIZONTAL DISTANCE FROM ANY BUILDING OPENING OR FRESH AIR INTAKE. EXTEND VTR 12" ABOVE ROOF SURFACE. PROVIDE 1" FIBERGLASS INSULATION WITH ALL-SERVICE JACKET ON VENT PIPE INSIDE BUILDING WITHIN 6' OF VTR LOCATION. VERIFY FLASHING AND COUNTERFLASHING AND COORDINATE INSTALLATION WITH ROOFING CONTRACTOR.
18. SOIL, WASTE, VENT PIPING AND FITTINGS SHALL BE PVC: ASTM D2665 SCHEDULE 40. JOINTS SHALL BE SOLVENT CEMENT. PROVIDE CAST IRON PIPE AND FITTINGS FOR SOIL, WASTE AND VENT PIPING LOCATED IN CEILING PLENUMS OR IN LOCATIONS OF HIGH TEMPERATURE WATER DISCHARGE IN THE KITCHEN AND LAUNDRY.	39. COORDINATION: CONTRACTOR SHALL COORDINATE ITS CONSTRUCTION OPERATIONS WITH THOSE OF OTHER CONTRACTORS AND ENTITIES TO ENSURE EFFICIENT AND ORDERLY INSTALLATION OF EACH PART OF THE WORK. CONTRACTOR SHALL COORDINATE ITS OPERATIONS WITH OTHER CONTRACTORS OPERATIONS, THAT DEPEND ON EACH OTHER FOR PROPER INSTALLATION, CONNECTION AND OPERATION.
19. PROVIDE CLEANOUTS FOR SANITARY AND STORM PIPING AT BASE OF EACH VERTICAL STACK, AT EACH CHANGE OF DIRECTION OF HORIZONTAL PIPE RUNS AND AT 100 FOOT INTERVALS OF HORIZONTAL RUNS FOR SANITARY AND STORM PIPING.	40. HEAT-TRACED PIPING SHALL MEET INSULATION THICKNESS REQUIREMENTS PER FLORIDA BUILDING CODE SIXTH EDITION 2017 - ENERGY CONSERVATION.
20. PROVIDE ACCESS PANELS TO VALVES WITHIN CHASES, WALLS, OR ABOVE NON-ACCESSIBLE CEILINGS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES. SEE SPECIFICATION SECTION 220553 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT FOR ENGRAVED LABELS FOR ALL ACCESS PANELS, VALVES, PLUMBING EQUIPMENT, ETC. PROVIDE ENGRAVED LABEL ON CEILING GRID AT EQUIPMENT LOCATION.	
21. SITE UTILITY CONNECTIONS SHOWN ON CIVIL DRAWINGS. ALL SERVICES SHOWN ON THIS SET OF PLANS TERMINATE 5'-0" FROM BUILDING, UNLESS SHOWN OTHERWISE ON DRAWINGS.	

SUBMITTALS AND SUBSTITUTIONS	
1. CONTRACTOR SHALL SUBMIT THE FOLLOWING EQUIPMENT FOR REVIEW PRIOR TO ORDERING AND INSTALLING: A. PLUMBING FIXTURES B. WATER HEATERS C. RECIRCULATION PUMPS D. PIPING	
2. PROCESSING TIME: ALLOW 10 WORKING DAYS FOR REVIEW OF EACH SUBMITTAL. ALLOW ADDITIONAL TIME IF COORDINATION WITH SUBSEQUENT SUBMITTALS IS REQUIRED. ENGINEER WILL ADVISE CONTRACTOR WHEN A SUBMITTAL BEING PROCESSED MUST BE DELAYED FOR COORDINATION.	
3. SUBMITTALS: PLACE A PERMANENT LABEL OR TITLE BLOCK ON EACH SUBMITTAL ITEM FOR IDENTIFICATION. INDICATE NAME OF FIRM OR ENTITY THAT PREPARED EACH SUBMITTAL ON LABEL OR TITLE BLOCK. PROVIDE A SPACE BESIDE TITLE BLOCK TO RECORD CONTRACTOR'S REVIEW AND APPROVAL. MARKINGS AND ACTION TAKEN BY ENGINEER. INCLUDE THE FOLLOWING INFORMATION FOR PROCESSING AND RECORDING ACTION TAKEN: A. PROJECT NAME. B. DATE. C. NAME OF ENGINEER. D. NAME OF CONTRACTOR. E. NAME OF SUBCONTRACTOR. F. NAME OF SUPPLIER. G. NAME OF MANUFACTURER. H. DRAWING NUMBER AND DETAIL REFERENCES, AS APPROPRIATE. I. LOCATION WHERE PRODUCT IS TO BE INSTALLED, AS APPROPRIATE.	
4. SUBMIT ELECTRONIC SUBMITTALS VIA EMAIL AS PDF ELECTRONIC FILES.	
5. PAPER SUBMITTALS: SUBMIT THREE PAPER COPIES OF EACH SUBMITTAL UNLESS OTHERWISE INDICATED. ENGINEER WILL RETURN TWO COPIES.	
6. COLLECT SUBMITTAL DATE INFORMATION INTO A SINGLE SUBMITTAL FOR EACH ELEMENT OF CONSTRUCTION AND TYPE OF PRODUCT OR EQUIPMENT. MARK EACH COPY OF EACH SUBMITTAL TO SHOW WHICH PRODUCTS AND OPTIONS ARE APPLICABLE. INCLUDE THE FOLLOWING INFORMATION, AS APPLICABLE: A. MANUFACTURER'S CATALOG CUTS. B. MANUFACTURER'S PRODUCT SPECIFICATIONS. C. STATEMENT OF COMPLIANCE WITH SPECIFIED REFERENCED STANDARDS. D. NOTATION OF COORDINATION REQUIREMENTS. E. WIRING DIAGRAMS SHOWING FACTORY-INSTALLED WIRING. F. PRINTED PERFORMANCE CURVES. G. OPERATIONAL RANGE DIAGRAMS. H. CLEARANCES REQUIRED TO OTHER CONSTRUCTION, IF NOT INDICATED ON ACCOMPANYING SHOP DRAWINGS.	
7. CONTRACTOR SHALL REVIEW EACH SUBMITTAL AND CHECK FOR COORDINATION WITH OTHER WORK OF THE CONTRACT AND FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS. NOTE CORRECTIONS AND FIELD DIMENSIONS. MARK WITH APPROVAL STAMP BEFORE SUBMITTING TO ENGINEER. APPROVAL STAMP: STAMP SHALL STATE THAT SUBMITTAL HAS BEEN REVIEWED, CHECKED, AND APPROVED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND INITIALLED AND DATED BY CONTRACTOR.	
8. ENGINEER WILL REVIEW EACH SUBMITTAL. MAKE MARKS TO INDICATE CORRECTIONS OR REVISIONS REQUIRED, AND RETURN IT. ENGINEER WILL STAMP EACH SUBMITTAL WITH AN ACTION STAMP AND WILL MARK STAMP APPROPRIATELY TO INDICATE ACTION.	
9. ENGINEER WILL NOT REVIEW SUBMITTALS THAT DO NOT BEAR CONTRACTOR'S APPROVAL STAMP AND INITIALS AND WILL RETURN THEM WITHOUT ACTION. INCOMPLETE SUBMITTALS ARE UNACCEPTABLE. WILL BE CONSIDERED NONRESPONSIVE, AND WILL BE RETURNED FOR RESUBMITTAL WITHOUT REVIEW. SUBMITTALS NOT REQUIRED BY THE CONTRACT DOCUMENTS MAY NOT BE REVIEWED AND MAY BE DISCARDED	
10. SUBSTITUTIONS A. SUBSTITUTION OFFERS OWNER A SUBSTANTIAL ADVANTAGE IN COST, TIME, ENERGY CONSERVATION, OR OTHER CONSIDERATIONS. B. SUBSTITUTION DOES NOT REQUIRE EXTENSIVE REVISIONS TO THE CONTRACT DOCUMENTS. CONTRACTOR SHALL COMPENSATE ENGINEER FOR ANY REDESIGN AND EVALUATION SERVICES INCLUDING CHANGES REQUIRED BY AUTHORITY HAVING JURISDICTION. C. SUBSTITUTION WILL NOT ADVERSELY AFFECT CONSTRUCTION SCHEDULE. D. SUBSTITUTION HAS RECEIVED NECESSARY APPROVALS OF AUTHORITIES HAVING JURISDICTION. E. SUBSTITUTION HAS BEEN COORDINATED WITH OTHER PORTIONS OF THE WORK. F. SUBSTITUTION PROVIDES SPECIFIED WARRANTY. G. SUBSTITUTION HAS BEEN COORDINATED WITH OTHER PORTIONS OF THE WORK, AND IS ACCEPTABLE TO ALL CONTRACTORS INVOLVED. H. CONTRACTOR SHALL ASSUME ANY ADDITIONAL CONSTRUCTION COSTS AS A RESULT OF THE SUBSTITUTION.	

FLORIDA BUILDING CODE SIXTH EDITION (2017) ENERGY CONSERVATION COMPLIANCE	
THE DESIGN COMPLIES WITH SECTION C401.2 APPLICATION ITEM 3:	
THE REQUIREMENTS OF SECTION C402.5, C403.2, C404, C405.2, C405.3, C405.5, C405.6 AND C407. THE BUILDING ENERGY COST SHALL BE EQUAL TO OR LESS THAN 85 PERCENT OF THE STANDARD REFERENCE DESIGN BUILDING.	

WATER HAMMER ARRESTOR SCHEDULE	
INSTALLED ARRESTOR SHALL BE APPROVED DEVICE BY FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING. = ALL SUPPLY PIPING SHALL HAVE ARRESTOR THE SAME SIZE AS CONNECTION SIZE UP TO 1" I.E. PROVIDE P.D.I. SIZE "C" FOR 1" OR LARGER WATER SUPPLY TO FIXTURES, P.D.I. SIZE "B" FOR 3/4" SUPPLY AND P.D.I. SIZE "A" FOR 1/2" SUPPLY.	
* P.D.I. SIZE	CONNECTION SIZE
A (1-11 F.U.)	1/2"
B (12-32 F.U.)	3/4"
C (33-60 F.U.)	1"
P.D.I. = PLUMBING AND DRAINAGE INSTITUTE STANDARD WH-201	



ARCHITECT:

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CONSULTANTS:

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CONSULTANTS:		
REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	3.05.2021

DRAWN BY: KMO
DESIGNED BY: KMO
REVIEWED BY: MNO

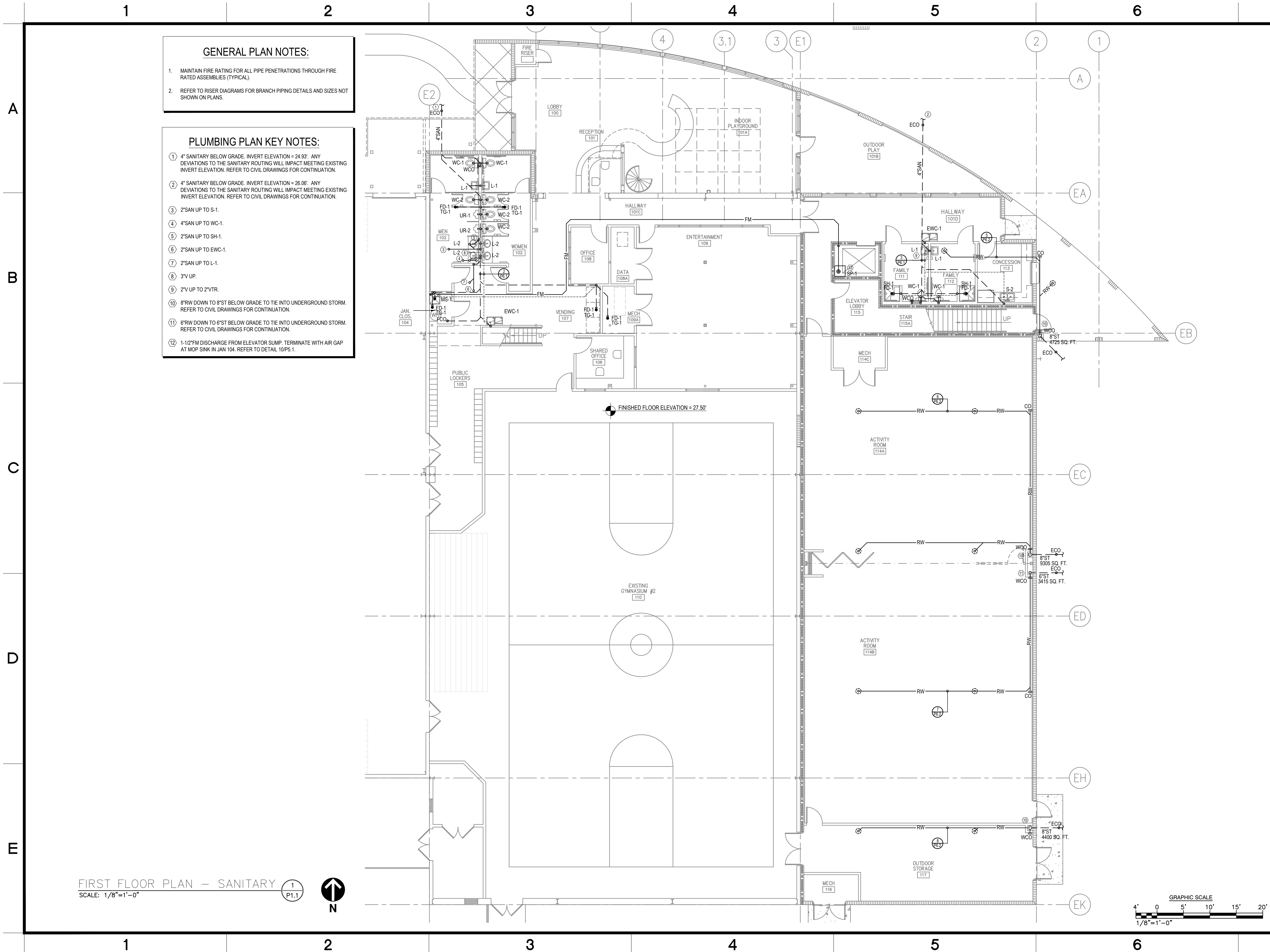
PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**PLUMBING
GENERAL INFORMATION**

MINDY N. O'NEAL
FL# 69779

SHEET #
P.O.1

PROJECT # 020004 DATE:02.08.2020



GENERAL PLAN NOTES:

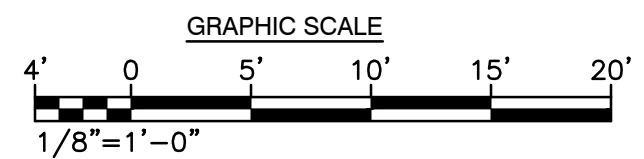
1. MAINTAIN FIRE RATING FOR ALL PIPE PENETRATIONS THROUGH FIRE RATED ASSEMBLIES (TYPICAL).
2. REFER TO RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.

PLUMBING PLAN KEY NOTES:

- ① 4" SANITARY BELOW GRADE. INVERT ELEVATION = 24.93'. ANY DEVIATIONS TO THE SANITARY ROUTING WILL IMPACT MEETING EXISTING INVERT ELEVATION. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
- ② 4" SANITARY BELOW GRADE. INVERT ELEVATION = 26.06'. ANY DEVIATIONS TO THE SANITARY ROUTING WILL IMPACT MEETING EXISTING INVERT ELEVATION. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
- ③ 2" SAN UP TO S-1.
- ④ 4" SAN UP TO WC-1.
- ⑤ 2" SAN UP TO SH-1.
- ⑥ 2" SAN UP TO EWC-1.
- ⑦ 2" SAN UP TO L-1.
- ⑧ 3" V UP.
- ⑨ 2" V UP TO 2" VTR.
- ⑩ 8" RW DOWN TO 8" ST BELOW GRADE TO TIE INTO UNDERGROUND STORM. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
- ⑪ 6" RW DOWN TO 6" ST BELOW GRADE TO TIE INTO UNDERGROUND STORM. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
- ⑫ 1-1/2" FM DISCHARGE FROM ELEVATOR SUMP. TERMINATE WITH AIR GAP AT MOP SINK IN JAN 104. REFER TO DETAIL 10/P5.1.

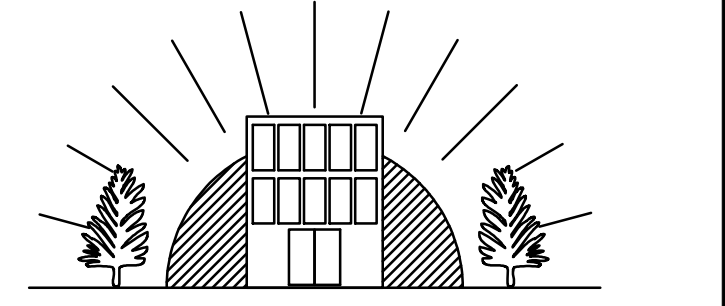
FIRST FLOOR PLAN - SANITARY
SCALE: 1/8"=1'-0"

1
P1.1



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913 NORTH NOVA RD.
HOLLY HILL, FL 32117
AA 26000567
PHONE (386) 255-6987
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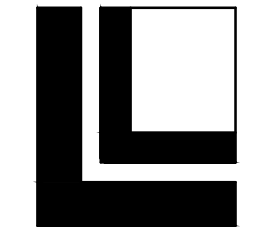
ARCHITECT:



DELOSE O'NEAL ENGINEERING

P.O. BOX 304
Goldenrod, FL 32733
P (407) 766-2813
C (321) 277-4128

CONSULTANTS:



LOWE STRUCTURES, INC.
11651 Central Parkway, Suite 106
Jacksonville, FL 32224
(904) 992-0377
FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

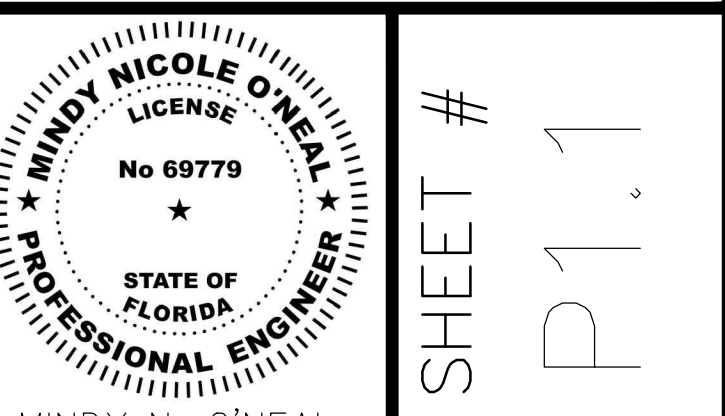
CONSULTANTS:

REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	3.05.2021

DRAWN BY: KMO
DESIGNED BY: KMO
REVIEWED BY: MNO

PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

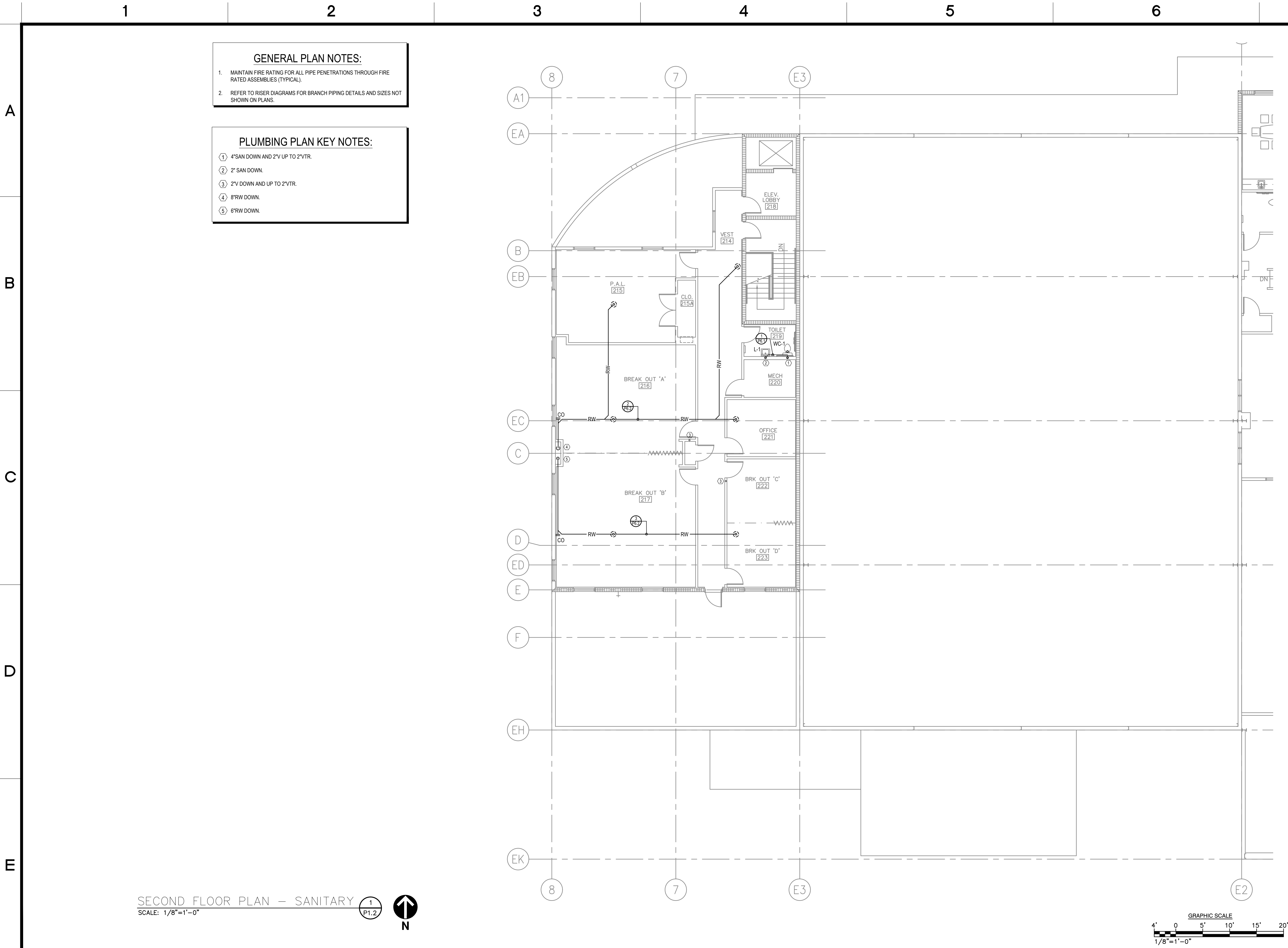
SHEET TITLE
**PARTIAL FIRST FLOOR
SANITARY PLAN**



MINDY N. O'NEAL
FL# 69779

PROJECT # 020004 DATE: 02.08.2020

SHEET #
P1.1



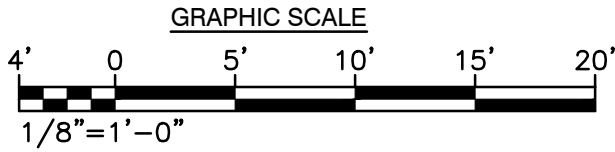
GENERAL PLAN NOTES:

1. MAINTAIN FIRE RATING FOR ALL PIPE PENETRATIONS THROUGH FIRE RATED ASSEMBLIES (TYPICAL).
2. REFER TO RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.

PLUMBING PLAN KEY NOTES:

- ① 4" SAN DOWN AND 2" V UP TO 2" VTR.
- ② 2" SAN DOWN.
- ③ 2" V DOWN AND UP TO 2" VTR.
- ④ 8" RW DOWN.
- ⑤ 6" RW DOWN.

SECOND FLOOR PLAN – SANITARY 1
SCALE: 1/8"=1'-0" P1.2
N



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ARCHITECT:

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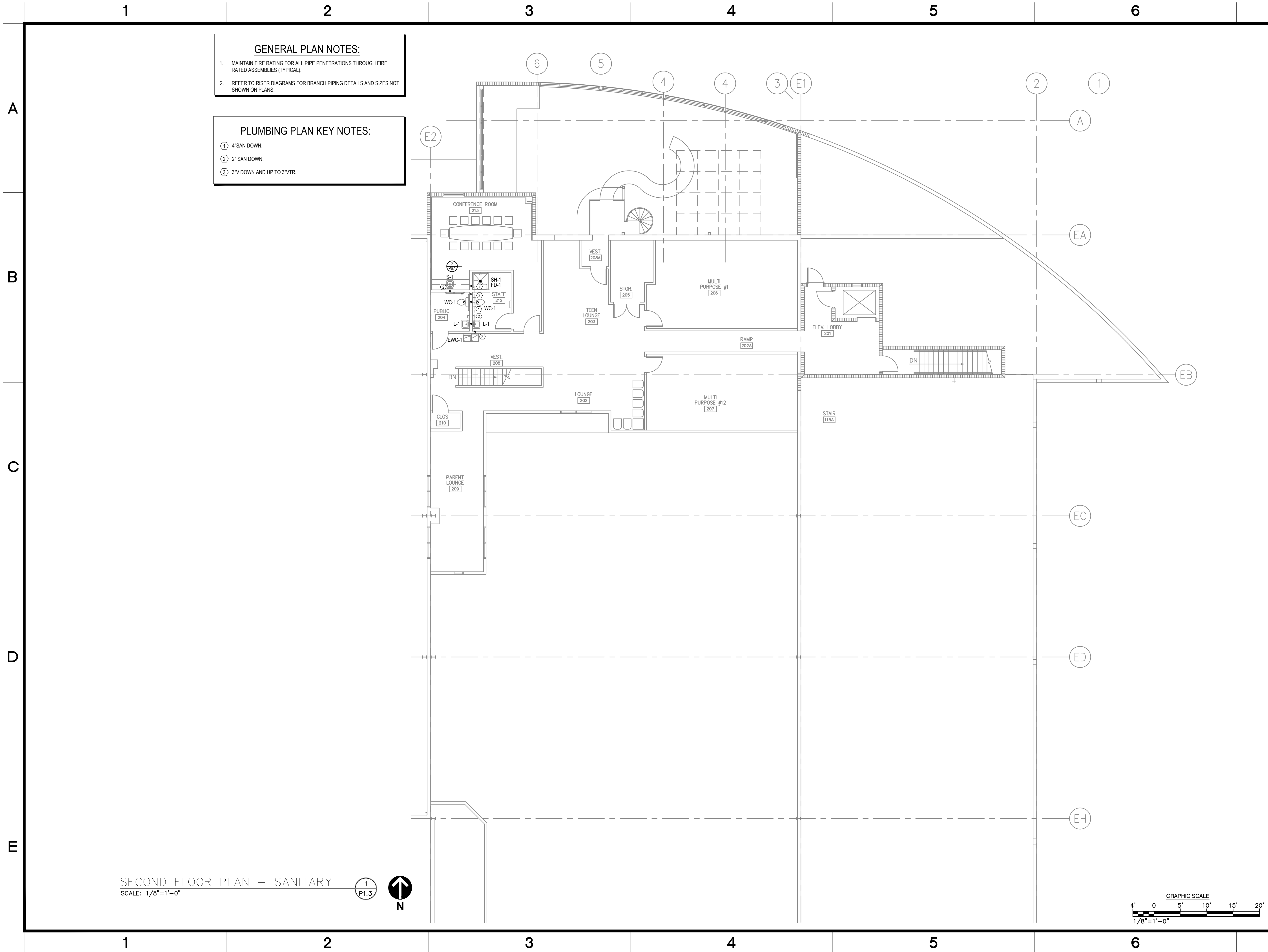
PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**PARTIAL SECOND FLOOR
SANITARY PLAN**

MINDY NICOLE O'NEAL
LICENSE
No 69779
★
STATE OF FLORIDA
PROFESSIONAL ENGINEER
MINDY N. O'NEAL
FL # 69779

SHEET #
P1.2

PROJECT # 020004
DATE: 02.08.2020



GENERAL PLAN NOTES:

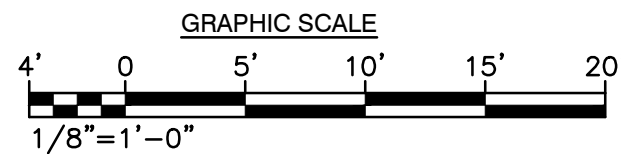
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2. REFER TO RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.

PLUMBING PLAN KEY NOTES:

- ① 4" SAN DOWN.
- ② 2" SAN DOWN.
- ③ 3" V DOWN AND UP TO 3" VTR.

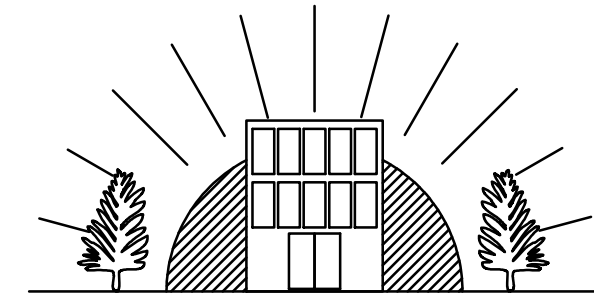
SECOND FLOOR PLAN – SANITARY
SCALE: 1/8"=1'-0"

1
P1.3



dj DESIGN, INC.
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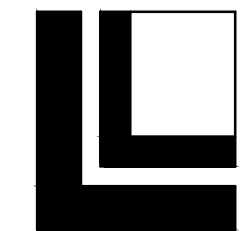
ARCHITECT:



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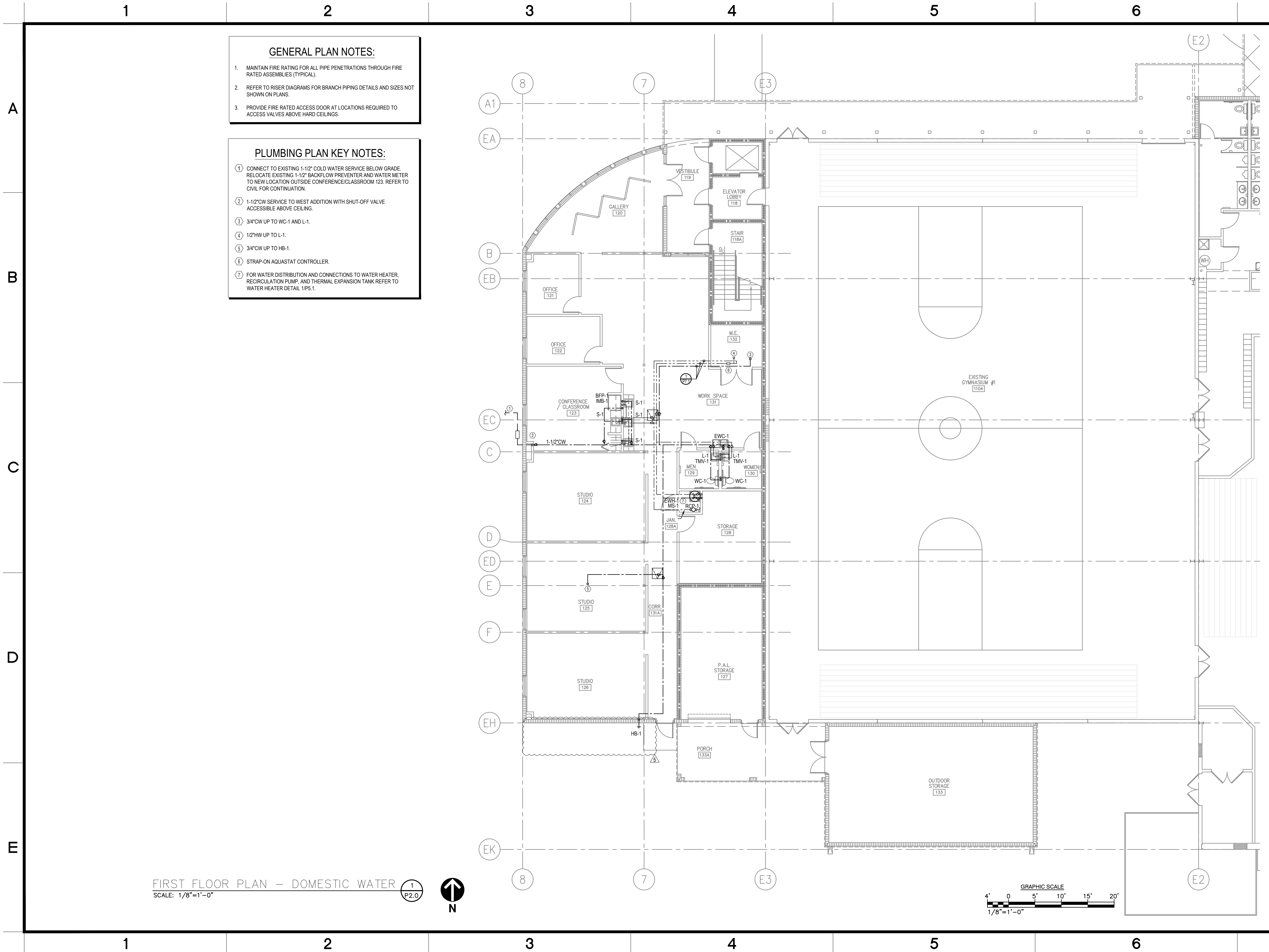
PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**PARTIAL SECOND FLOOR
SANITARY PLAN**



SHEET #
P1.3

PROJECT # 020004 DATE: 02.08.2020



- GENERAL PLAN NOTES:**
1. MAINTAIN FIRE RATING FOR ALL PIPE PENETRATIONS THROUGH FIRE RATED ASSEMBLIES (TYPICAL).
 2. REFER TO RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.
 3. PROVIDE FIRE RATED ACCESS DOOR AT LOCATIONS REQUIRED TO ACCESS VALVES ABOVE HARD CEILINGS.

- PLUMBING PLAN KEY NOTES:**
- ① CONNECT TO EXISTING 1-1/2" COLD WATER SERVICE BELOW GRADE. RELOCATE EXISTING 1-1/2" BACKFLOW PREVENTER AND WATER METER TO NEW LOCATION OUTSIDE CONFERENCE/CLASSROOM 123. REFER TO CIVIL FOR CONTINUATION.
 - ② 1-1/2"CW SERVICE TO WEST ADDITION WITH SHUT-OFF VALVE ACCESSIBLE ABOVE CEILING.
 - ③ 3/4"CW UP TO WC-1 AND L-1.
 - ④ 1/2"HW UP TO L-1.
 - ⑤ 3/4"CW UP TO HB-1.
 - ⑥ STRAP-ON AQUASTAT CONTROLLER.
 - ⑦ FOR WATER DISTRIBUTION AND CONNECTIONS TO WATER HEATER, RECIRCULATION PUMP, AND THERMAL EXPANSION TANK REFER TO WATER HEATER DETAIL 1/P.1.

FIRST FLOOR PLAN – DOMESTIC WATER

SCALE: 1/8"=1'-0"

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ARCHITECT:

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PORT ORANGE, FLORIDA

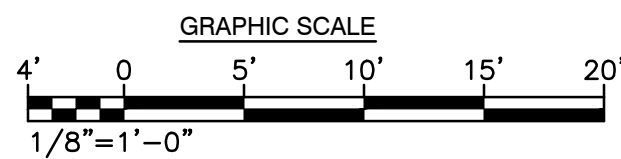
SHEET TITLE
**PARTIAL FIRST FLOOR
DOMESTIC WATER PLAN**

MINDY NICOLE O'NEAL
LICENSE
No 69779
STATE OF FLORIDA
PROFESSIONAL ENGINEER

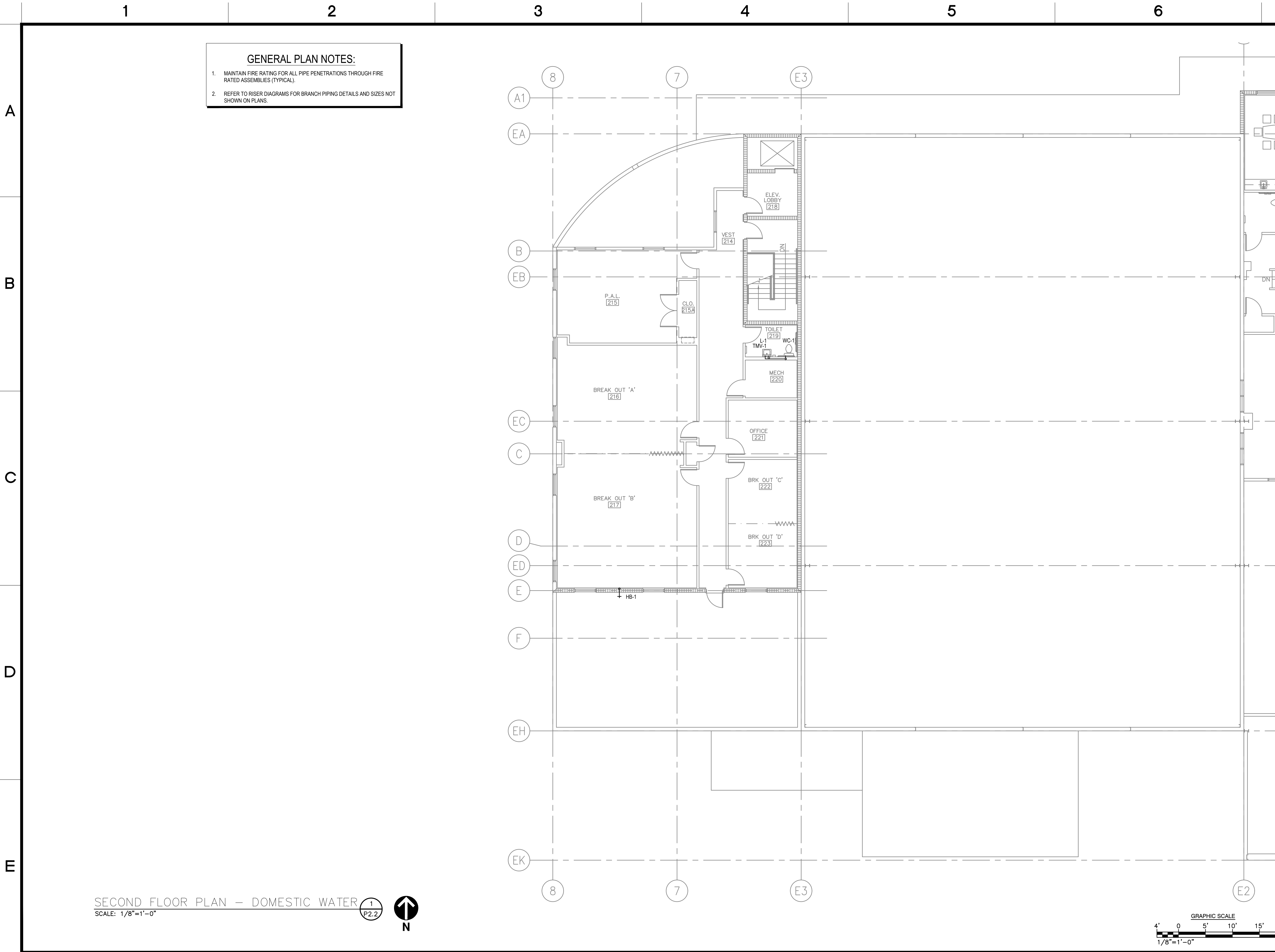
SHEET #
P 2.0

MINDY N. O'NEAL
FL# 69779

PROJECT # 020004 DATE:02.08.2020



PROJECT # 020004 | DATE:02.08.2020



- GENERAL PLAN NOTES:**
1. MAINTAIN FIRE RATING FOR ALL PIPE PENETRATIONS THROUGH FIRE RATED ASSEMBLIES (TYPICAL).
 2. REFER TO RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.

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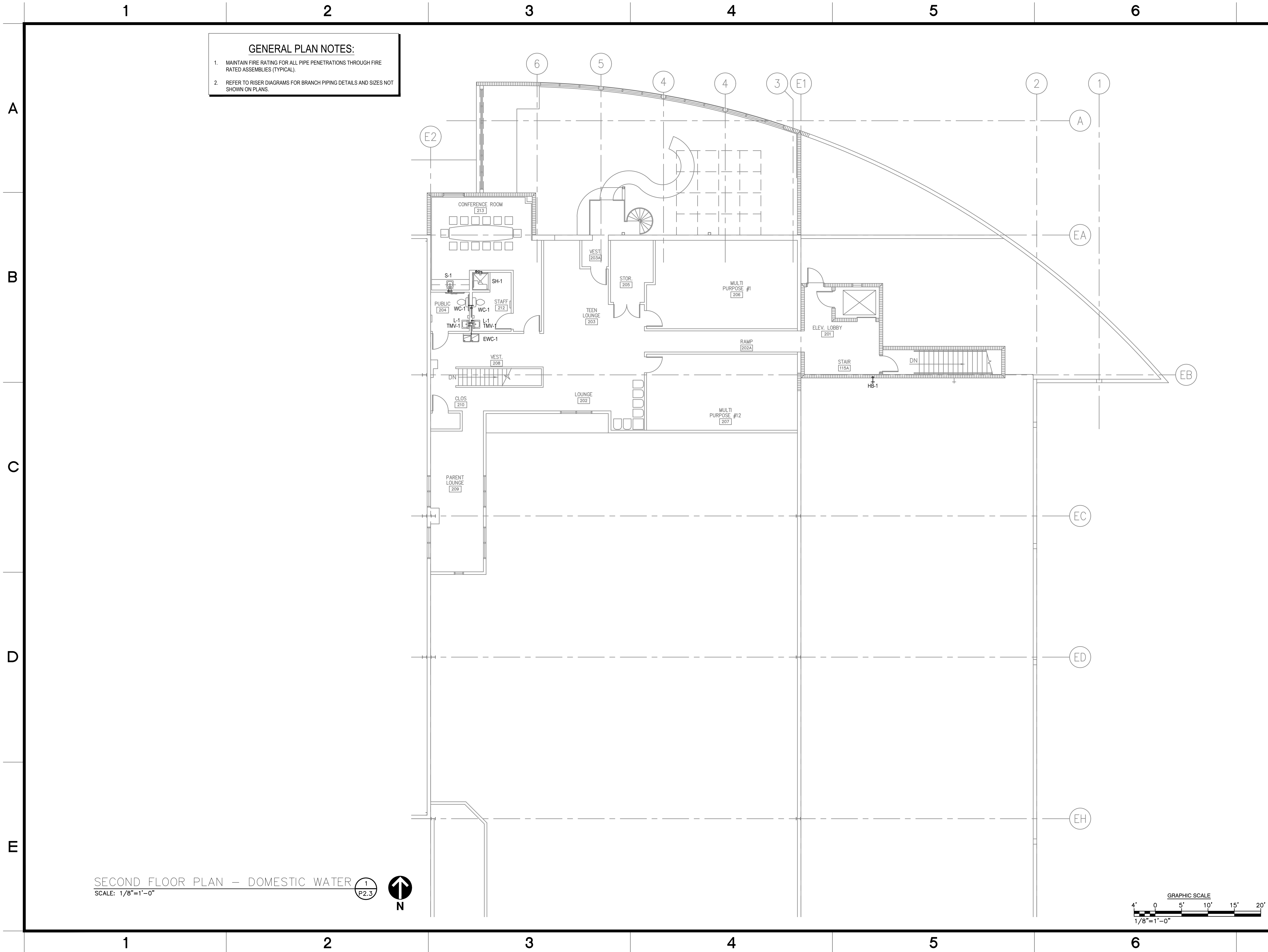
PROJECT TITLE AND ADDRESS
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4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**PARTIAL SECOND FLOOR
DOMESTIC WATER PLAN**

MINDY NICOLE O'NEAL
LICENSE
No 69779
★
STATE OF FLORIDA
PROFESSIONAL ENGINEER
MINDY N. O'NEAL
FL# 69779

SHEET #
P 2.2

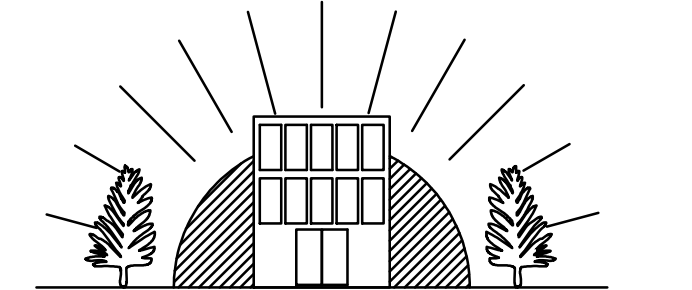
PROJECT # 020004 DATE: 02.08.2020



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ARCHITECT:



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PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

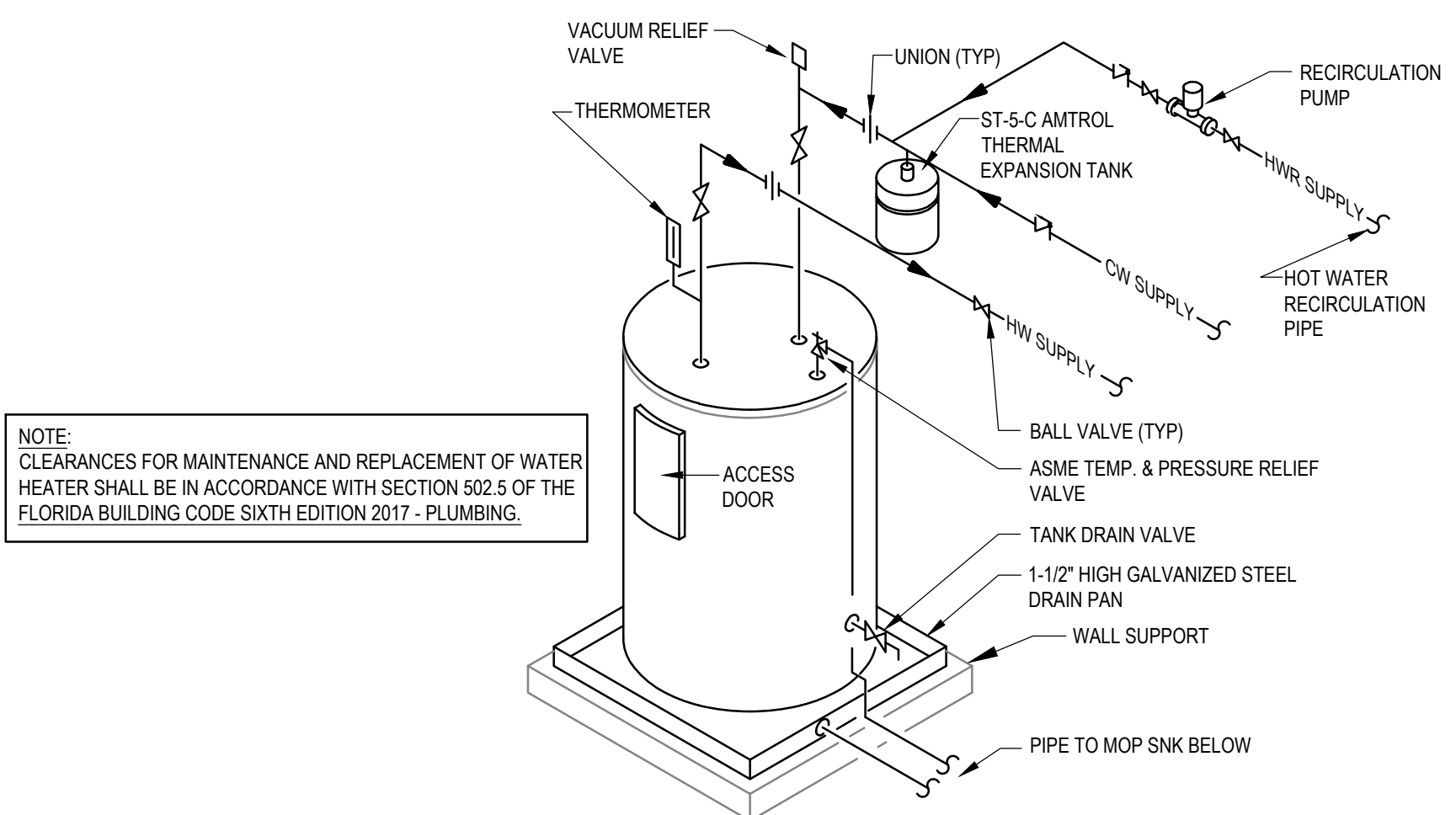
SHEET TITLE
**PARTIAL SECOND FLOOR
DOMESTIC WATER PLAN**

MINDY NICOLE O'NEAL
LICENSE
No 69779
★
STATE OF FLORIDA
PROFESSIONAL ENGINEER

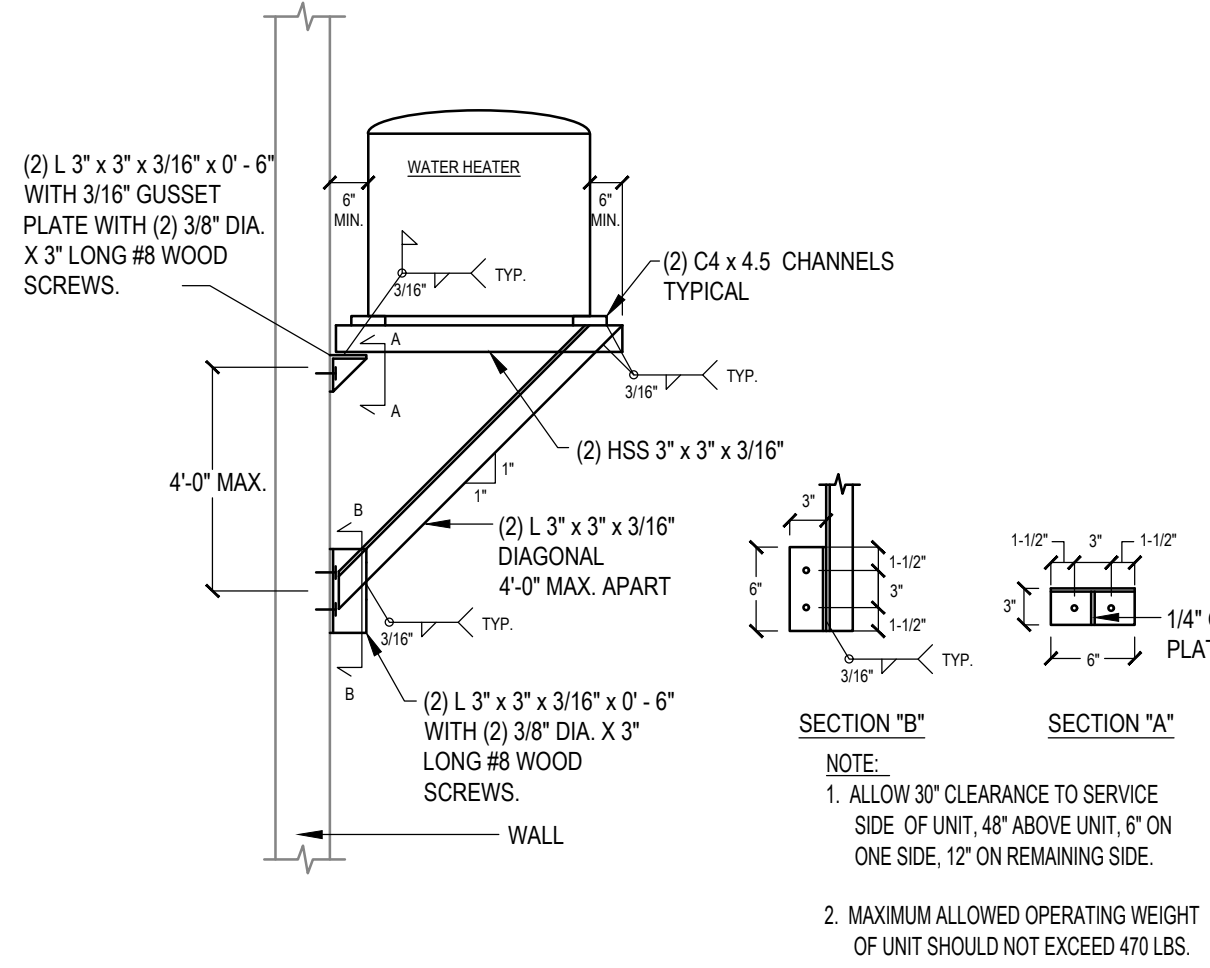
SHEET #
P2.3

MINDY N. O'NEAL
FL# 69779

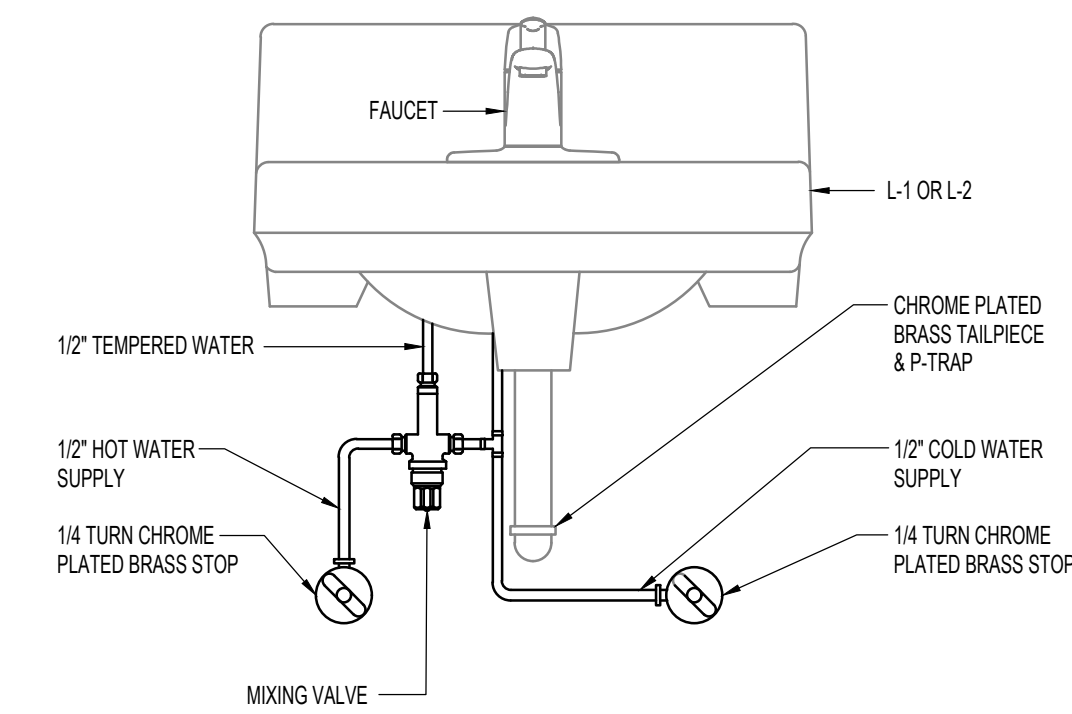
PROJECT # 020004 DATE:02.08.2020



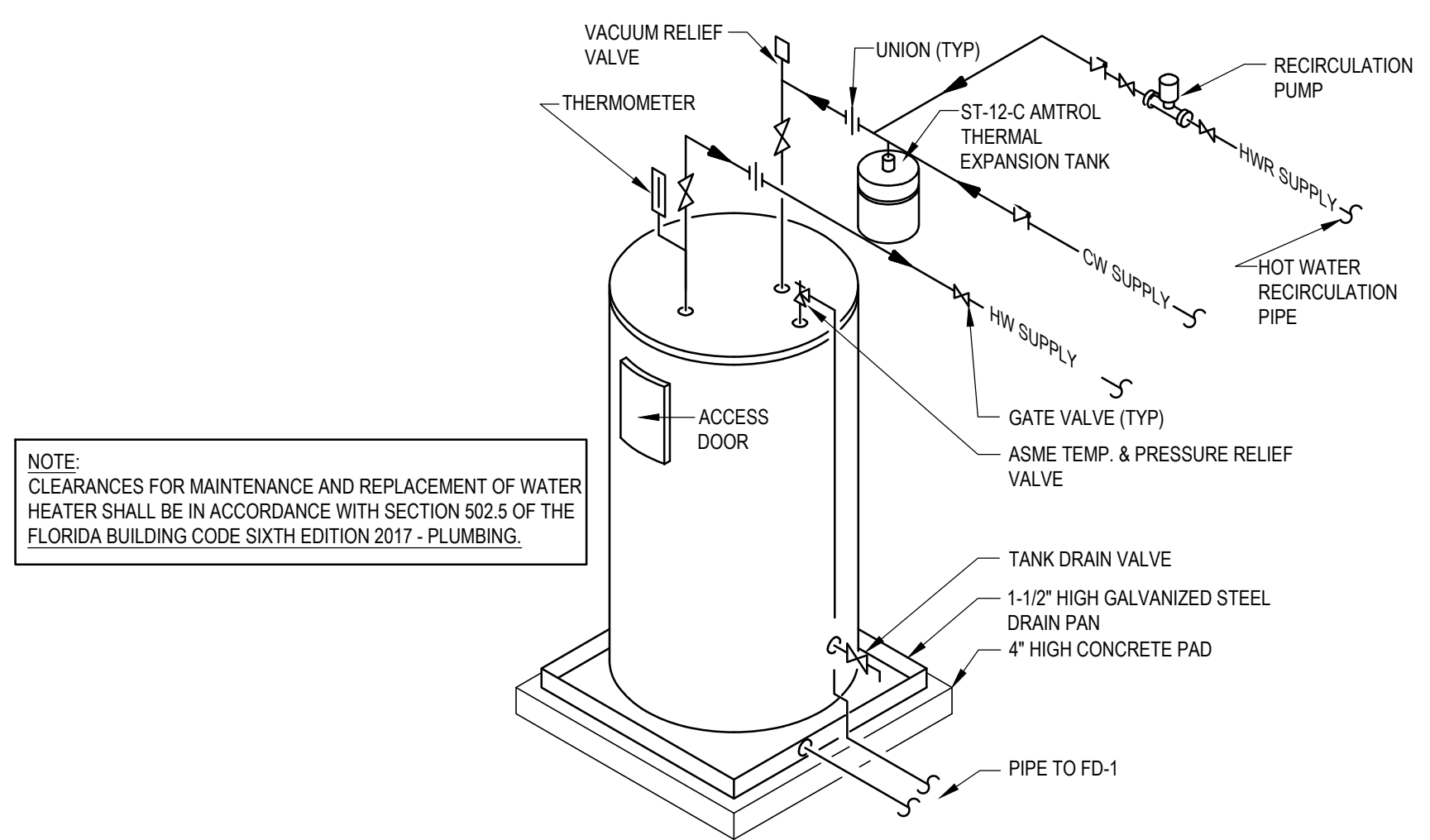
1 Water Heater Above Mop Sink Detail
SCALE: NOT TO SCALE



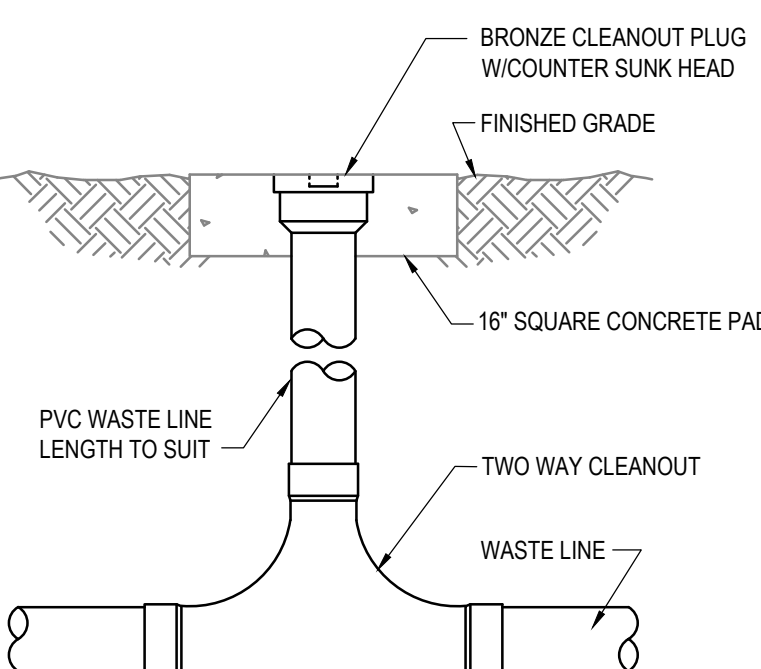
2 Water Heater Wall Support Detail
SCALE: NOT TO SCALE



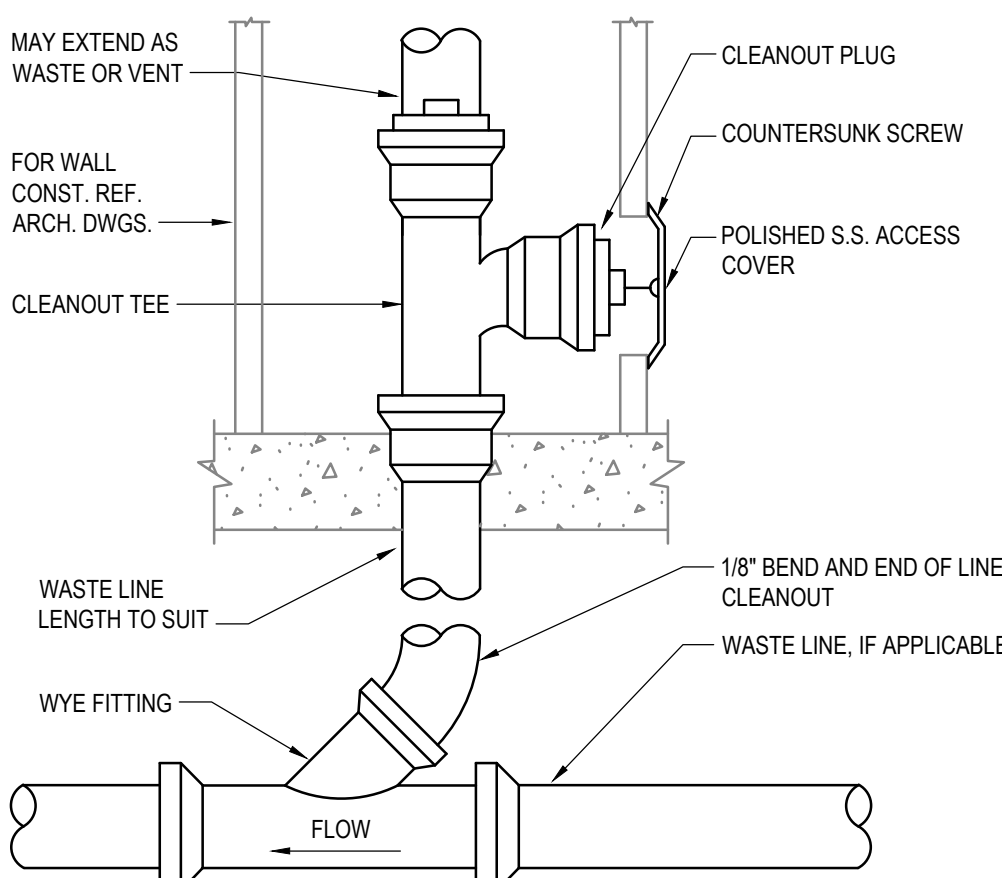
3 Tempering Valve Under Lav Detail
SCALE: NOT TO SCALE



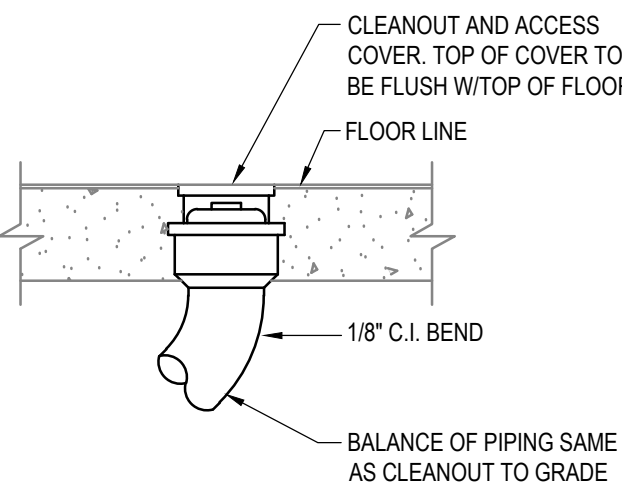
4 Water Heater Detail
SCALE: NOT TO SCALE



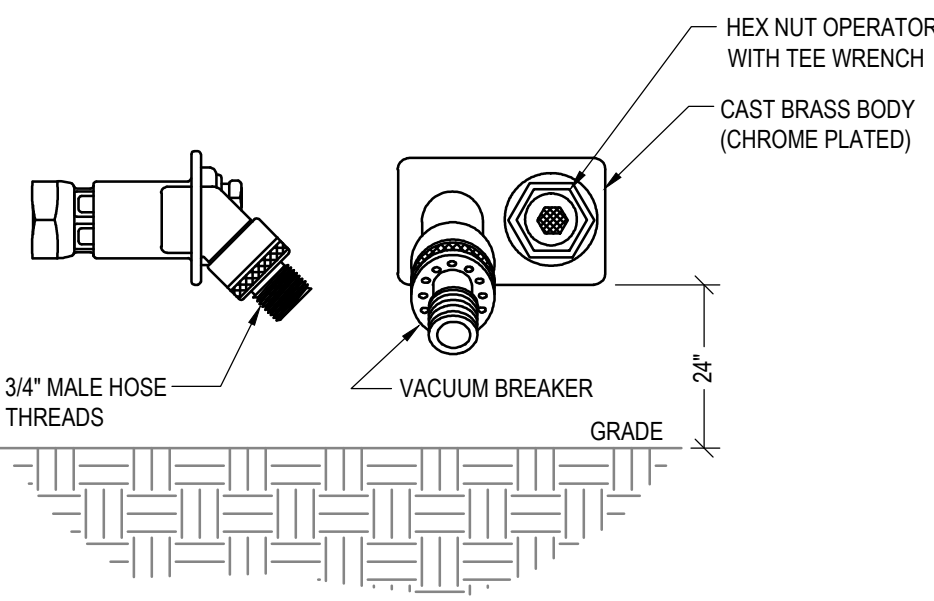
5 External Cleanout Detail
SCALE: NOT TO SCALE



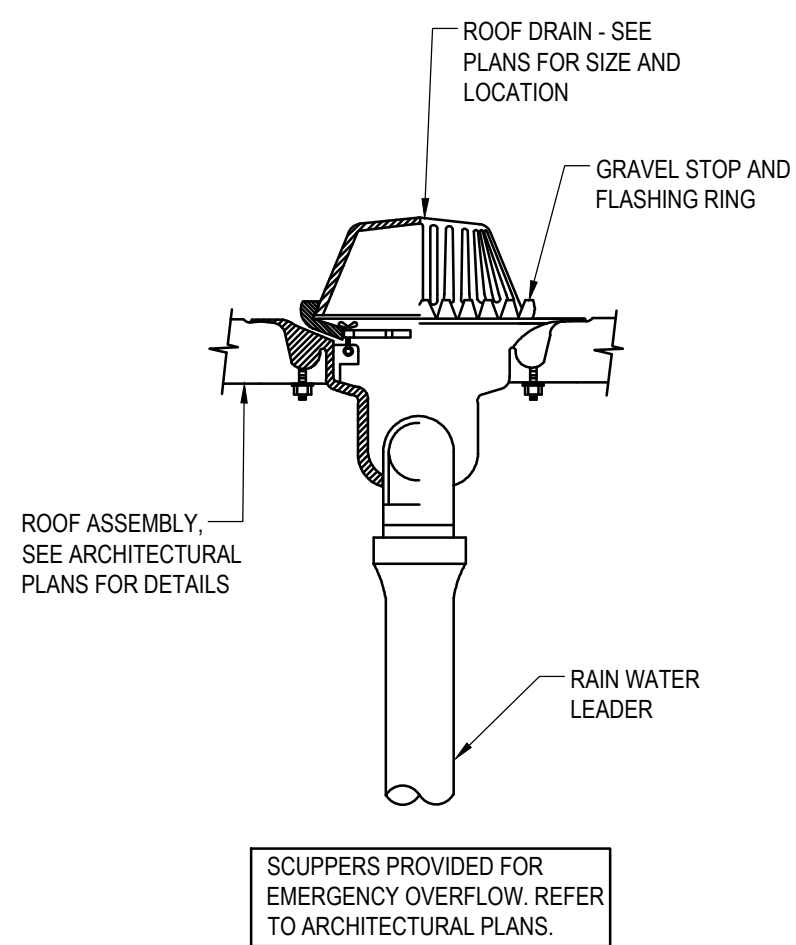
6 Wall Cleanout Detail
SCALE: NOT TO SCALE



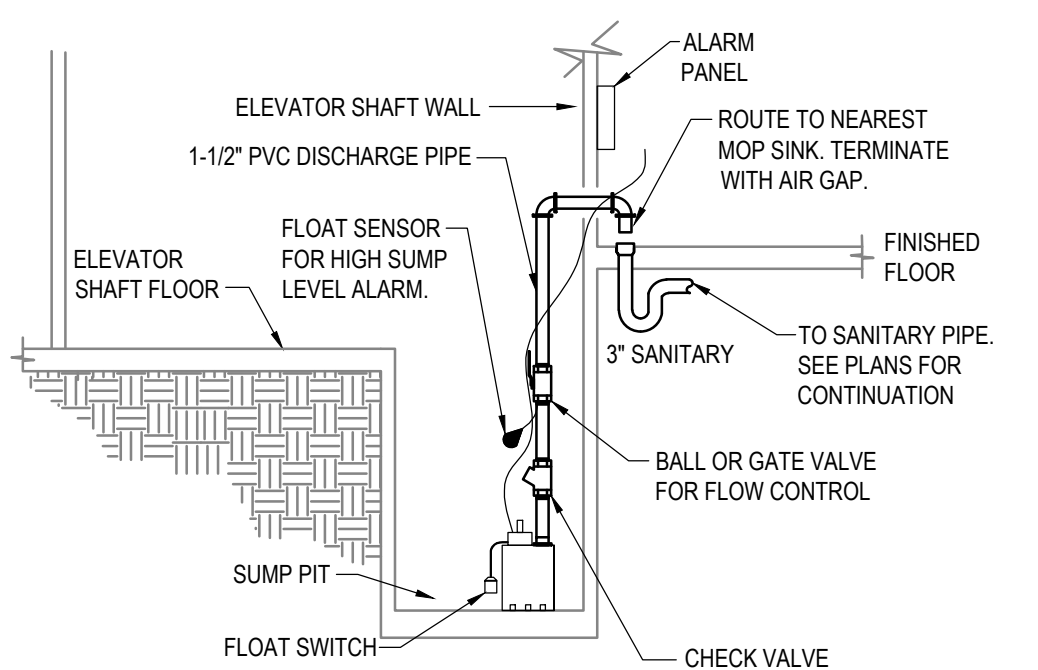
7 Floor Cleanout Detail
SCALE: NOT TO SCALE



8 Hose Bibb Detail
SCALE: NOT TO SCALE



9 Roof Drain Detail
SCALE: NOT TO SCALE



10 Elevator Sump Pump Detail
SCALE: NOT TO SCALE

NOTES:
1. ALL ITEMS SHIPPED LOOSE FOR PIPING AND WIRING BY CONTRACTOR.
2. ALL PIPING, VALVES, FIELD WIRING, ETC TO BE PROVIDED BY CONTRACTOR.
3. PROVIDE CHECK VALVE.
4. HIGH LEVEL FLOAT SENSOR AND CONDUCTIVITY PROBE WIRING TO BE TETHERED TO DISCHARGE PIPING BY CONTRACTOR.
5. INSTALLATION TO BE IN ACCORDANCE WITH N.E.C. AND LOCAL CODES.

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ARCHITECT:

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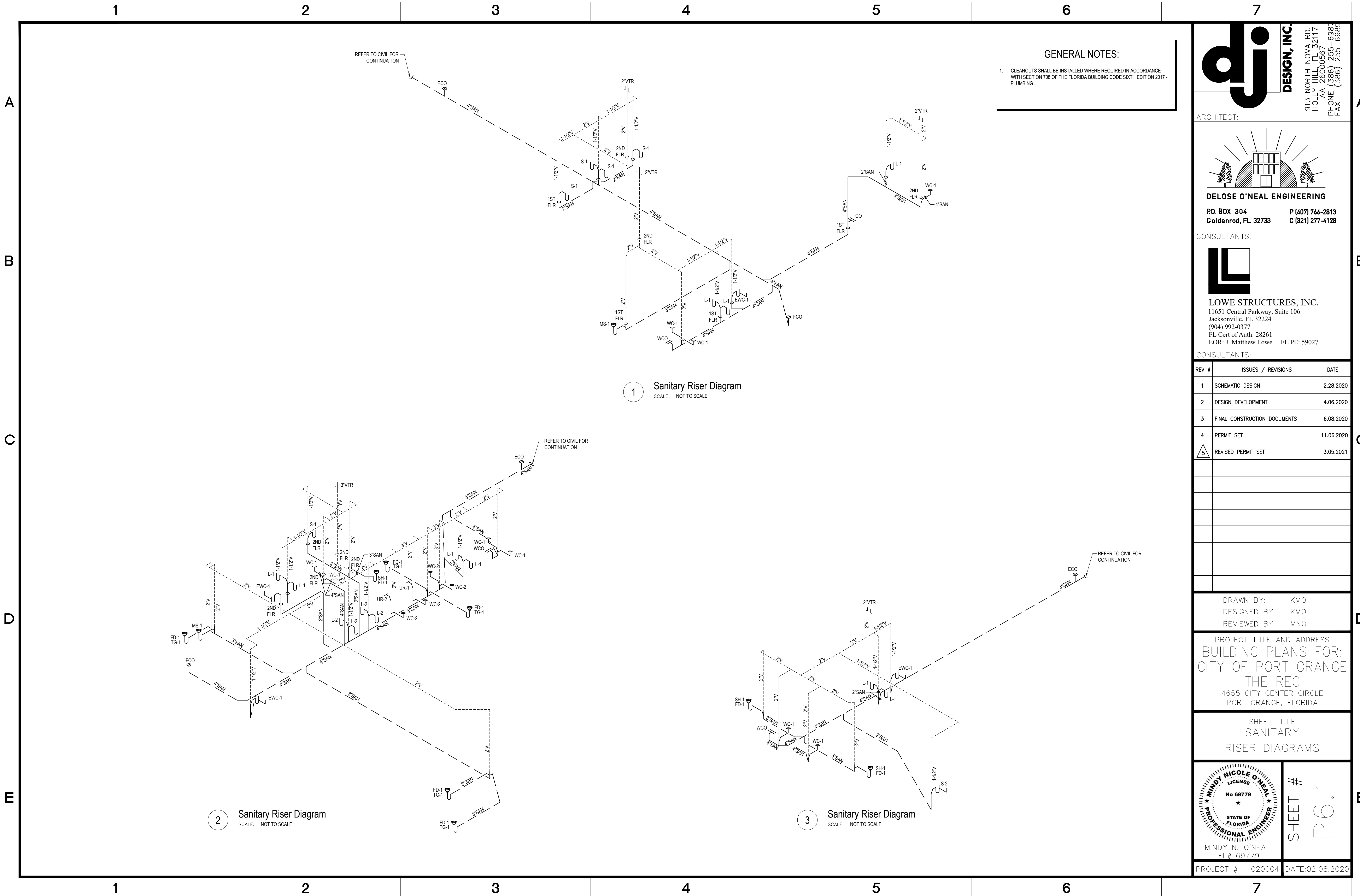
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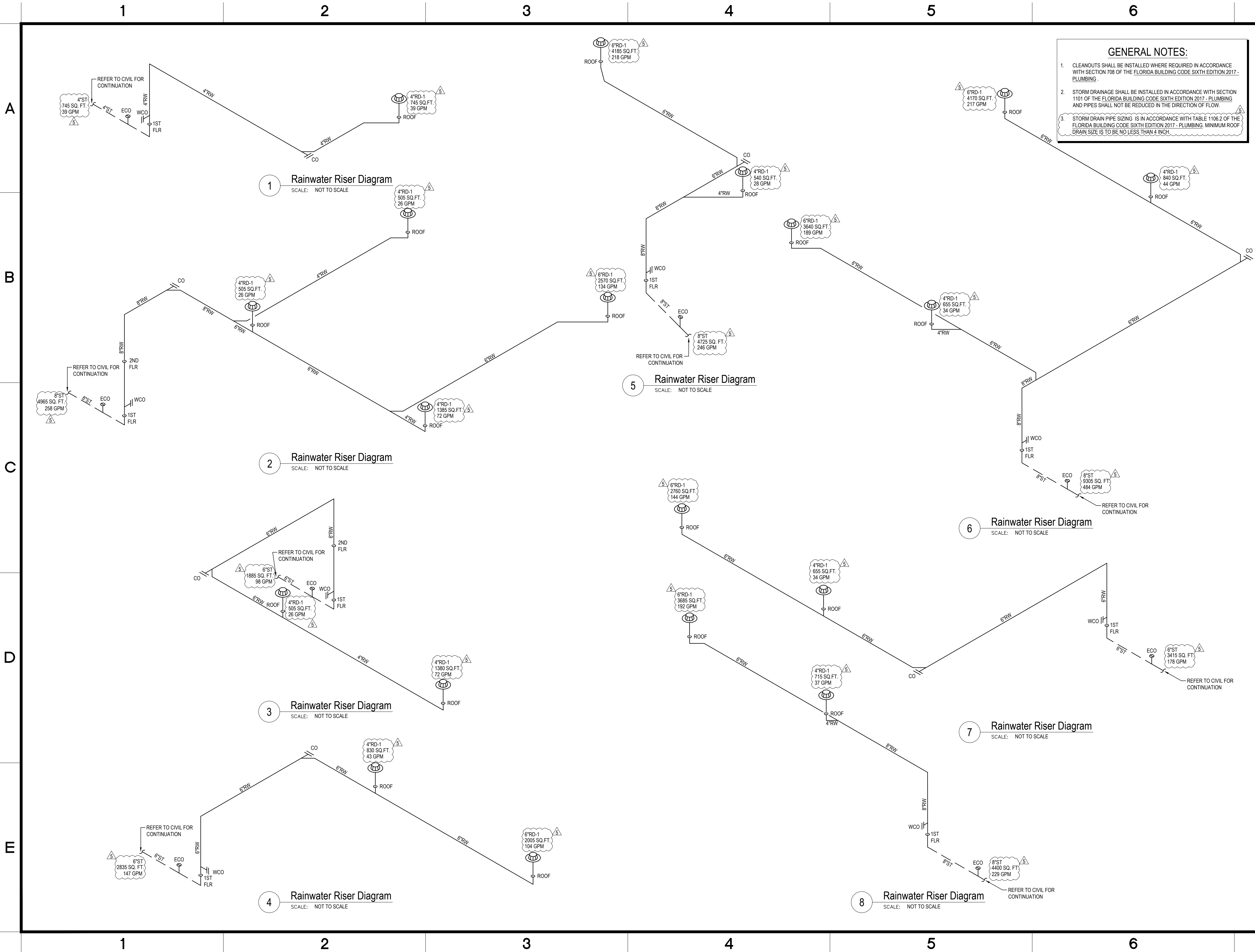
SHEET TITLE
**PLUMBING
DETAILS**

MINDY N. O'NEAL
FL# 69779

SHEET #
P5.1

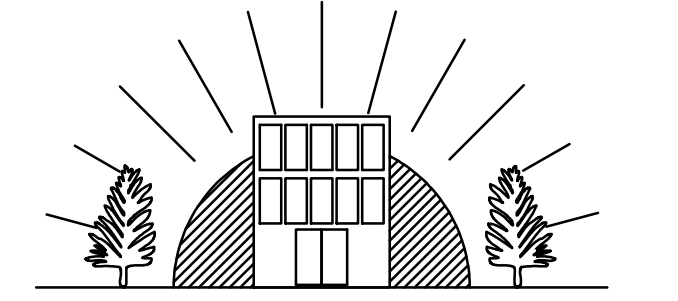
PROJECT # 020004 DATE: 02.08.2020

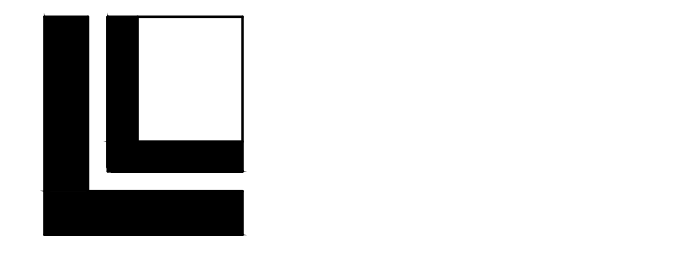




- GENERAL NOTES:**
1. CLEANOUTS SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 708 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING.
 2. STORM DRAINAGE SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 1101 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING AND PIPES SHALL NOT BE REDUCED IN THE DIRECTION OF FLOW.
 3. STORM DRAIN PIPE SIZING IS IN ACCORDANCE WITH TABLE 1106.2 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING. MINIMUM ROOF DRAIN SIZE IS TO BE NO LESS THAN 4 INCH.

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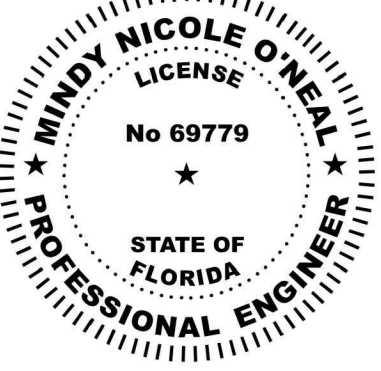
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SHEET TITLE
**RAINWATER
RISER DIAGRAMS**

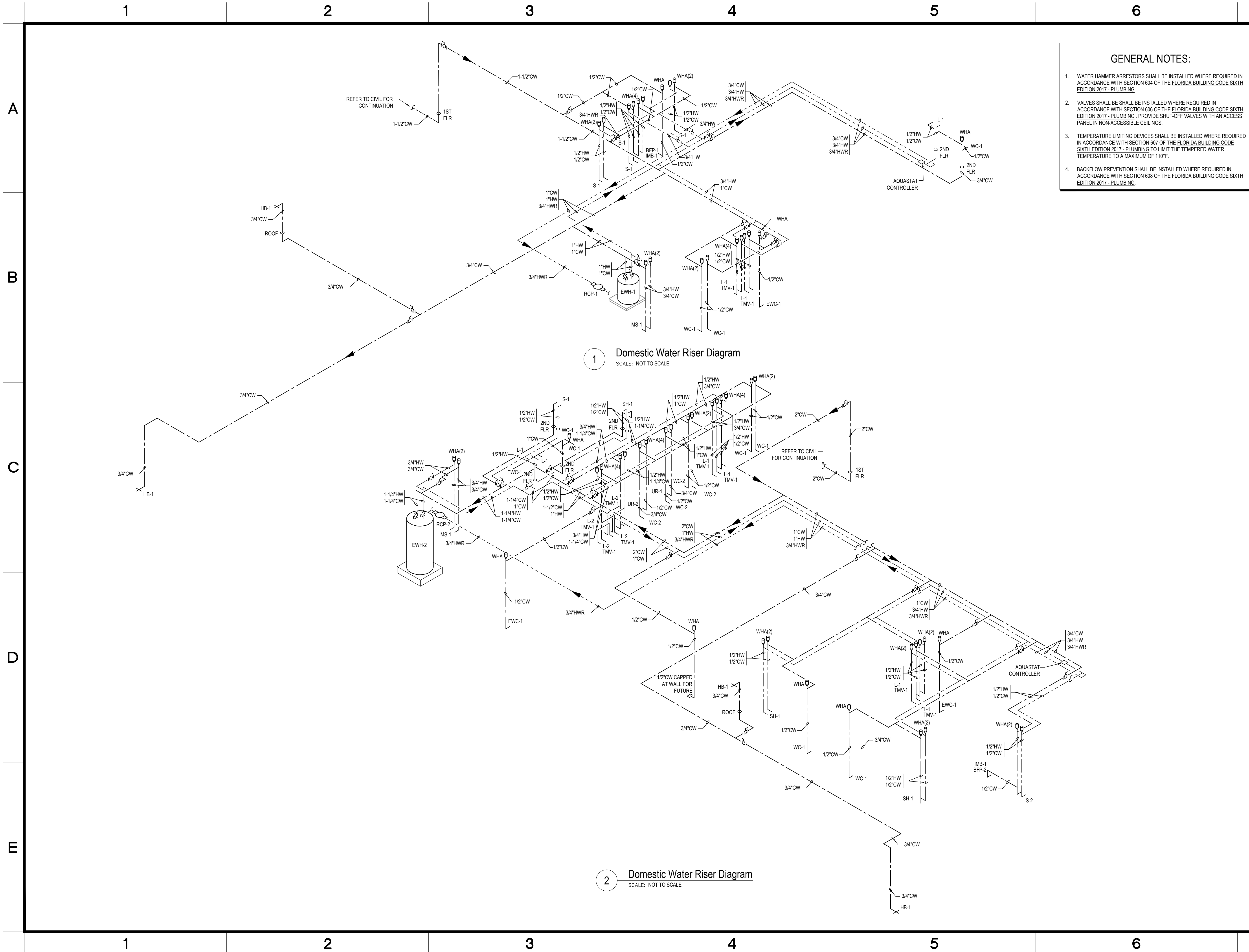


MINDY N. O'NEAL
FL# 69779

SHEET #

P. 6.2

PROJECT # 020004 DATE: 02.08.2020

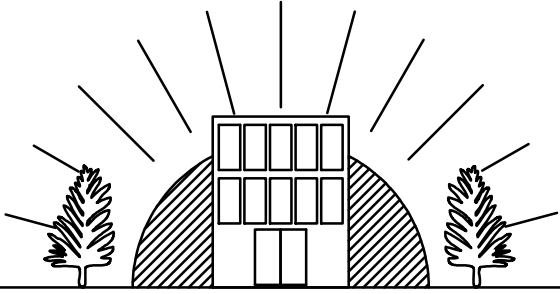


GENERAL NOTES:

1. WATER HAMMER ARRESTORS SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 604 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING .
2. VALVES SHALL BE SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 606 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING . PROVIDE SHUT-OFF VALVES WITH AN ACCESS PANEL IN NON-ACCESSIBLE CEILINGS.
3. TEMPERATURE LIMITING DEVICES SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 607 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING . PROVIDE SHUT-OFF VALVES WITH AN ACCESS PANEL IN NON-ACCESSIBLE CEILINGS.
4. BACKFLOW PREVENTION SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 608 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING .



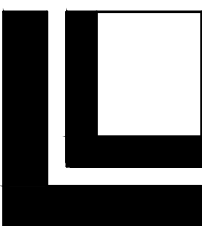
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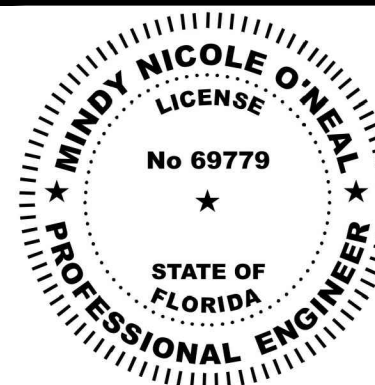
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4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
DOMESTIC WATER
RISER DIAGRAMS



MINDY N. O'NEAL
FL# 69779

SHEET #
P7.1

PROJECT # 020004 DATE:02.08.2020

*BUILDING PLANS FOR:
CITY OF PORT ORANGE - THE REC
CITY CENTER CIRCLE, PORT ORANGE, FL*

PARTITION & SYMBOL LEGEND

[illegible]

1. THESE DRAWINGS AND THE PROJECT MANUAL ARE COMPLEMENTARY, AND ANY REQUIREMENT OF ONE SHALL BE A REQUIREMENT OF THE OTHER. IT IS THE CONTRACTORS RESPONSIBILITY TO EXAMINE THE DRAWINGS AND SPECIFICATIONS AND TO COMPARE THE REQUIREMENTS OF EACH DIVISION (i.e. CIVIL, ARCHITECTURAL, STRUCTURAL, ELECTRICAL, ETC.) AND ENSURE THAT EACH TRADE OR SUBCONTRACTOR IS MAKING THE ALLOWANCES NECESSARY TO PROVIDE THE OWNER A COMPLETE FACILITY, OPERATIONAL IN ALL RESPECTS. UNLESS OTHERWISE SPECIFICALLY NOTED IN THE DRAWINGS OR PROJECT MANUAL, IT IS ALSO THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE ARCHITECT/ENGINEER OF ANY DEFICIENCIES OR DISCREPANCIES AMONG THE DIVISIONS OF THE DRAWINGS AND SPECIFICATIONS PRIOR TO THE BID DATE. NEITHER THE OWNER NOR ARCHITECT/ENGINEER WILL BE RESPONSIBLE FOR ANY DEFICIENCIES OR DISCREPANCIES RAISED AFTER THE BID OPENING. ACCORDINGLY, IN LIGHT OF THESE OBLIGATIONS, THE ARCHITECT/ENGINEER IS OBLIGATED TO INTERPRET THE DRAWINGS AND SPECIFICATIONS IN A MANNER THAT WILL PROVIDE THE OWNER WITH A COMPLETE, FUNCTIONING FACILITY FOR THE BID PRICE.
2. ALL IMPROVEMENTS SHALL BE IN ACCORDANCE WITH FLORIDA STATUTES CHAPTER 553 WITH RESPECT TO HANDICAPPED ACCESSIBILITY DESIGN AND CONSTRUCTION STANDARDS.
3. ALL NEW DOORS INSTALLED IN THE MEANS OF EGRESS INCLUDING EXIT ACCESS DOORS FROM ALL WALK-IN ROOMS AND AREAS SHALL BE 36" WIDE THEREBY PROVIDING A MINIMUM 32" CLEAR OPENING.
4. DOOR HARDWARE FURNISHED FOR NEW DOORS OR RELOCATED DOORS INSTALLED IN THE MEANS OF EGRESS, INCLUDING EXIT ACCESS DOORS, WILL BE OPERABLE FROM THE INSIDE WITHOUT SPECIAL KEY EFFORT OF KNOWLEDGE. THE HARDWARE SHALL BE LEVER HANDLE OR EQUAL (PANIC HARDWARE IN ASSEMBLY OCCUPANCY) PER FLORIDA STATUTE 553. DOORS SHALL RELEASE WHEN NO MORE THAN 15 LB. IS APPLIED TO THE RELEASING APPROVED, DOOR CLOSER PER NFPA 5-121 (C).
5. CHANGES IN ELEVATIONS OF 1/4" TO 1/2" SHALL BE BEVELED AT A SLOPE OF 1:2 OR LESS, CHANGES IN ELEVATION OF 1/2" TO 30" SHALL BE RAMPED WITH REQUIRED PLATFORMS AND RAILINGS PER THE 2011 EDITION OF THE FLORIDA BUILDING CODE.
6. ANY AND ALL DEVIATIONS FROM SPECIFIED PRODUCTS MUST BE APPROVED BY THE ARCHITECT.
7. PAINT ALL NEW SURFACES AS SCHEDULED AND AS REQUIRED TO ASSURE A UNIFORM APPEARANCE.
8. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO CONTROL DUST AND MUD ASSOCIATED WITH THE WORK OF THIS PROJECT. EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND METHOD USED SHALL MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS, PER FDOT SPECIFICATIONS, SECTION 104.
9. ALL PROPOSED CONSTRUCTION SHALL BE PURSUANT TO INFORMATION SHOWN ON THESE PLANS AND LOCAL CODES. ALL NECESSARY LICENSES AND PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AT HIS EXPENSE UNLESS PREVIOUSLY OBTAINED BY THE OWNER.
10. THE EXISTENCE AND LOCATION OF HIDDEN UTILITIES ARE NOT GUARANTEED AND SHALL BE INVESTIGATED AND VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING WORK. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGES TO, AND FOR PROPER MAINTENANCE PROTECTION OF, EXISTING UTILITIES AND STRUCTURES DURING THE CONSTRUCTION PROCESS. THE CONTRACTOR SHALL BE LIABLE FOR ANY COSTS ASSOCIATED WITH THE RELOCATION OF TELEPHONE OR GAS LINES BY THE UTILITY COMPANIES.
11. THE CONTRACTOR SHALL PROVIDE SAFE, SUFFICIENT, AND PROPER FACILITIES AT ALL TIMES FOR THE INSPECTION OF THE WORK BY THE OWNER, ENGINEER, AND ALL APPROPRIATE GOVERNMENTAL AND REGULATORY AGENCIES.
12. PARTITION WALLS SHALL BE CONSTRUCTED OF MATERIALS AS ALLOWED BY MINIMUM TYPE IIB CONSTRUCTION TYPE PER CHAPTER 7 OF THE 2011 EDITION OF THE FLORIDA BUILDING CODE.
13. INTERIOR FINISH CLASSIFICATION SHALL BE CLASS 'A' FLAME SPREAD 0-25 SMOKE DEVELOPED 0-450 AT EXIT ACCESS AND CLASS 'B' FLAME SPREAD 26-75 SMOKE DEVELOPED 0-450 AT OTHER AREAS AS PER CHAPTER 8 OF THE 2011 EDITION OF THE FLORIDA BUILDING CODE FOR TYPE IIB CONSTRUCTION TYPE.
14. NEW TABLES, WORK SURFACES, COUNTER HEIGHTS, UNDER SURFACE CLEARANCE AND OVER COUNTER REACH SHALL COMPLY WITH THE 2011 EDITION OF THE FLORIDA BUILDING CODE. ACCESSIBILITY: THESE WORK SURFACES SHALL PROVIDE A MINIMUM UNDER SURFACE HEIGHT OF 28"-34" FOR EACH POSSIBLE WHEELCHAIR LOCATION AND WITH 48" CLEARANCE AROUND THE COUNTER FOR MANEUVERING CLEARANCE.

 DANA M. SMITH AR0009483	SHEET # A0.0
PROJECT • 02354.20	DATE • 6.3.2018



SYMBOL	DESCRIPTION	REMARKS
	1 HOUR FIRE RATING	
	2 HOUR FIRE RATING	
	FIRE DOOR / RATING (HOURS)	
	LIFE SAFETY SYMBOLS	
	FIRE EXTINGUISHER	
	EGRESS CAPACITY FACTOR	
	A) DOOR SIZE OR STAIR WIDTH (INCHES) B) EGRESS CAPACITY FACTOR (INCHES) C) MAX ALLOWABLE LOAD D) ACTUAL OCCUPANT LOAD	
	OCCUPANT LOAD	
	A) OCCUPANCY PER TABLE 1004.12 B) ACTUAL FLOOR AREA C) OCCUPANT LOAD FACTOR PER TABLE 1004.12 D) ACTUAL LOAD	
	TRAVEL DISTANCE	
	DISTANCE FROM MOST REMOTE POINT IN OCCUPANT AREA	
	DIRECTION OF TRAVEL / PATH OF TRAVEL	
	START / FINISH OF TRAVEL DISTANCE	
	EMERGENCY EXIT LIGHTS	

OCCUPANTS: MEN WOMEN	WATER CLOSETS		LAVATORIES		DRINKING FOUNTAINS	SERVICE SINKS
	MALE	FEMALE	MALE	FEMALE		
	1/150	1/75	1/200	1/200		
REQUIRED	1	2	1	1	1	1
PROVIDED (NEW)	5 WC / 2 UR	6	1	1	2	1
EXISTING	1 WC / 1 UR	2	2	2	0	0

PROJECT • 02354.20	DATE: 6.3.2018
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1. DEMOLITION SHALL BE COMPLETED ONLY TO EXTENT NECESSARY TO PERFORM NEW WORK. ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETELY. PATCH HOLES & SURFACES REMAINING SHALL BE SMOOTH, CLEAN, AND READY TO ACCEPT NEW WORK, TYPICALLY.
2. OWNER WILL REMOVE MOVABLE APPLIANCES (COMPUTERS), FURNITURE A/V EQUIPMENT, FURNISHINGS AND ARTWORK PRIOR TO START OF DEMOLITION, TYPICAL IN ALL ROOMS SHOWN.
3. SEE ELECTRICAL PLANS FOR SCOPE OF WORK.
4. CAP AND REPAIR ANY DAMAGE TO IRRIGATION SYSTEM DURING CONSTRUCTION.

EXISTING PARTITION TO REMAIN

EXISTING PARTITION OR ELEMENT
TO BE REMOVED

NEW WALL OR PARTITION

DOOR AND FRAME TO BE REMOVED.

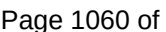
EXISTING DOOR AND FRAME TO REMAIN.

NEW DOOR, FRAME & HARDWARE

EXISTING SLAB ON GRADE TO
BE REMOVED.

- 1 REMOVE ALL FLOOR FINISHES (CARPET, HARD TILE OR VINYL TILE) AND BASE. PREPARE ALL FLOOR FOR NEW FINISHES, TYPICAL IN ALL AREAS AFFECTED.
- 2 REMOVE EXISTING STAIRS AS SHOWN.
- 3 REMOVE EXISTING WALLS AND ASSOCIATED APPURTENANCES TO EXTENT SHOWN AND AS NECESSARY TO PERFORM NEW WORK.
- 4 REMOVE EXISTING DOOR, FRAME AND HARDWARE IN ITS ENTIRETY.
- 5 REMOVE EXISTING ACOUSTICAL PANELS & SUSPENSION SYSTEM TO THE EXTENT INDICATED.
- 6 REMOVE EXISTING PORTE COCHERE, INCLUDING SLAB ON GRADE, FOUNDATIONS, COLUMNS, BEAMS & ROOF.
- 7 DEMOLISH EXISTING TOILET PARTITIONS / BRACING.
- 8 REMOVE EXISTING FENCE ENCLOSURE AND RELOCATE MECHANICAL EQUIPMENT, PER MECH. DWG.
- 9 REMOVE EXISTING PORTICO AND STORAGE ADDITION, INCLUDING SLAB ON GRADE & FOUNDATION.
- 10 REMOVE CATCH BASIN AND STORM PIPE PER CIVIL DRAWINGS.
- 11 REMOVE EXISTING IRRIGATION PIPING AND VALVES.
- 12 REMOVE EXISTING PLUMBING FIXTURES, PREPARE CONNECTIONS FOR NEW WATER CLOSETS, LAVATORIES AND URINALS. SEE PLUMBING DRAWINGS.
- 13 DEMOLISH EXISTING DOWNSPOUT ENCLOSURES, REPAIR DAMAGED SUB-STRATE AND PREPARE FOR NEW FINISH.
- 14 REMOVE EXISTING WINDOW'S AS SHOWN, PATCH OPENING PER REVISED PLAN.
- 15 REMOVE EXISTING SANITARY PIPING, SEE CIVIL DRAWINGS.
- 16 REMOVE AND RELOCATE BRONZE DEDICATION PLAQUE. PER OWNER'S DIRECTIVE.
- 17 EXISTING FDC TO BE RELOCATED.
- 18 RELOCATE FLOOR DRAIN TO ROOM 1034 & RECONNECT AS SHOWN ON PLUMBING DRAWINGS.
- 19 RELOCATE DATA RACK TO ROOM 1034.
- 20 REMOVE EXISTING AHU/ACU - ALTERNATE #1.

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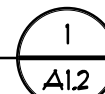




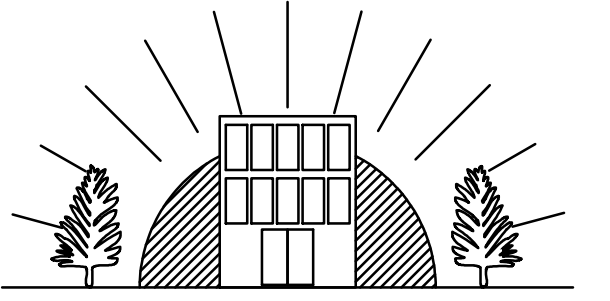
 DANA M. SMITH AR0009483	SHEET # A1.0
PROJECT ■ 02364.20	DATE: 6.3.2018



SCALE: 1/8"=1'-0"



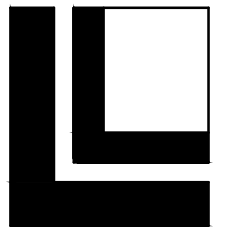
**913 NORTH NOVA RD.
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ARCHITECT.**DELOSE O'NEAL ENGINEERING**

P.O. BOX 304
Goldenrod, FL 32733

P (407) 766-2813
C (321) 277-4128

CONSULTANTS:



LOWE STRUCTURES, INC.

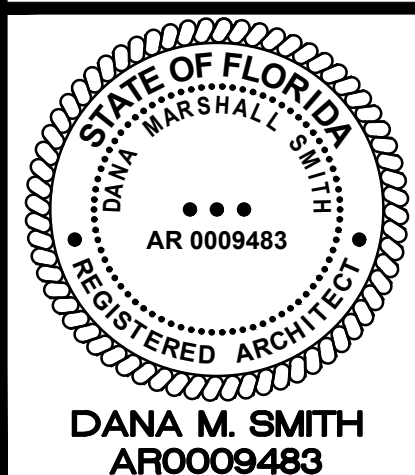
11651 Central Parkway, Suite 106
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FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

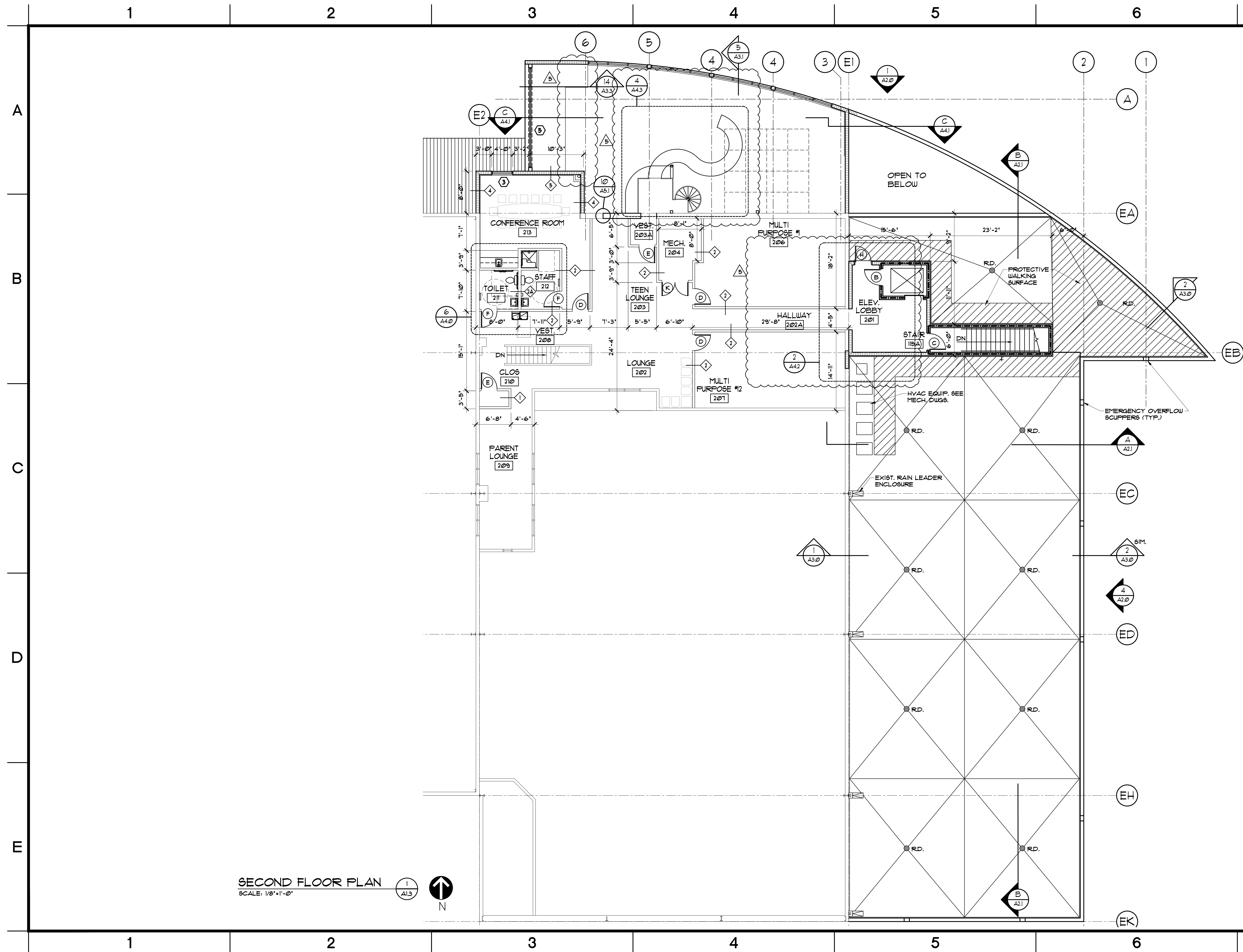
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BUILDING PLANS FOR
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
PARTIAL SECOND
FLOOR PLAN



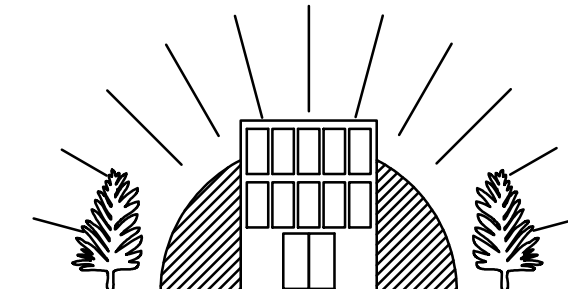
SHEET #
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PROJECT • 02354.20	DATE: 6.3.2018
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AA 26000587
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FAX (386) 256-6889

ARCHITECT.

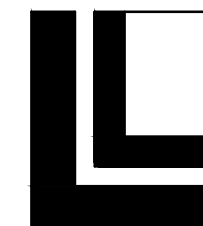


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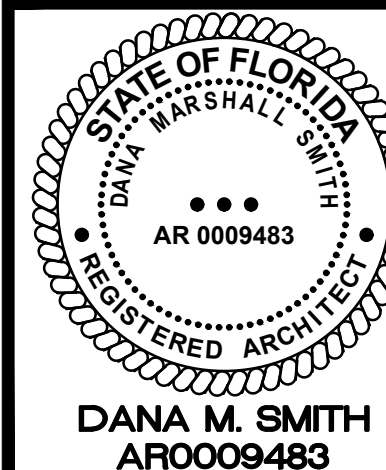
CONSULTANTS:

REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.6.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.8.2020
4	PERMIT SET	11.6.2020
5	REVISED PERMIT SET	2.22.2021

DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

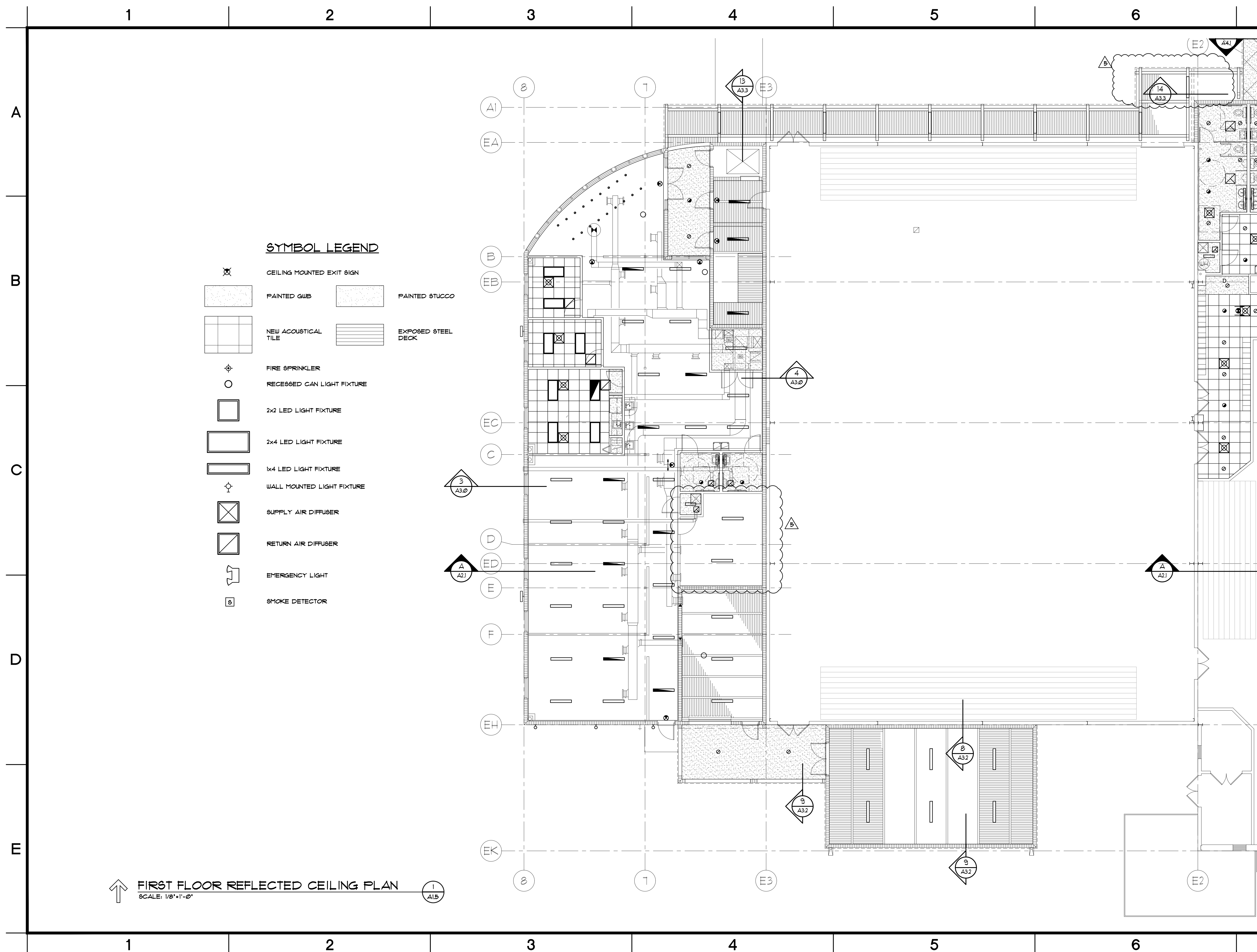
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FLOOR PLAN**

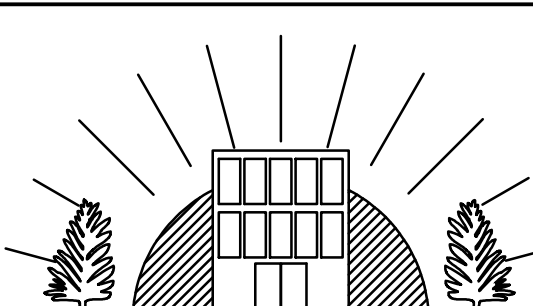
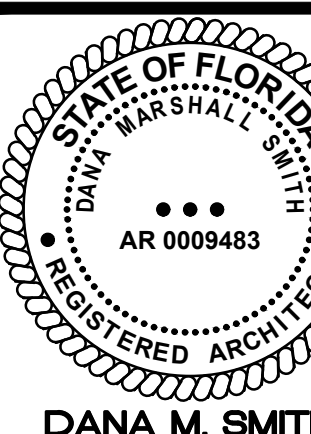


DANA M. SMITH
AR0009483

SHEET #
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PROJECT # 02354.20 DATE: 6.3.2018



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CONSULTANTS: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">REV #</th> <th style="width: 70%;">ISSUES / REVISIONS</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr><td>1</td><td>SCHEMATIC DESIGN</td><td>2.28.2020</td></tr> <tr><td>2</td><td>DESIGN DEVELOPMENT</td><td>4.6.2020</td></tr> <tr><td>3</td><td>FINAL CONSTRUCTION DOCUMENTS</td><td>6.8.2020</td></tr> <tr><td>4</td><td>PERMIT SET</td><td>11.6.2020</td></tr> <tr><td>5</td><td>REVISED PERMIT SET</td><td>2.22.2021</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>			REV #	ISSUES / REVISIONS	DATE	1	SCHEMATIC DESIGN	2.28.2020	2	DESIGN DEVELOPMENT	4.6.2020	3	FINAL CONSTRUCTION DOCUMENTS	6.8.2020	4	PERMIT SET	11.6.2020	5	REVISED PERMIT SET	2.22.2021																											
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 DANA M. SMITH AFOO09483		SHEET # A1.5																																													
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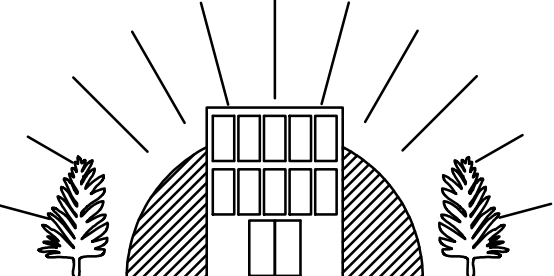
 DANA M. SMITH AR0009483	SHEET # A1.7
PROJECT • 02354.20	DATE• 6.3.2018





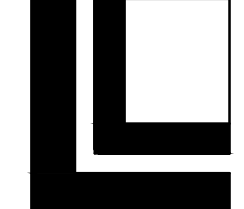
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ARCHITECT.



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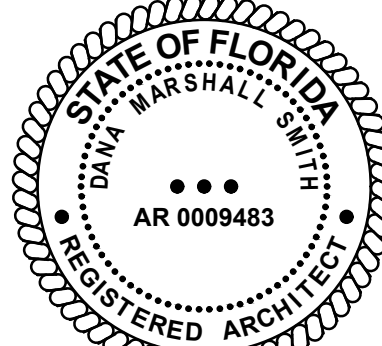
LOWE STRUCTURES, INC.
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DESIGNED BY: DMS
REVIEWED BY: DMS

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
PARTIAL SECOND
REFLECTED CEILING



STATE OF FLORIDA
DANA MARSHALL SMITH
AR 0009483
REGISTERED ARCHITECT

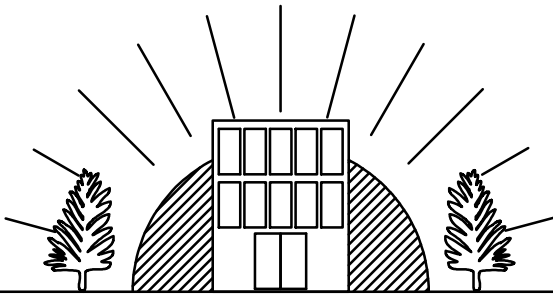
DANA M. SMITH
AR0009483

SHEET #
A1.8

PROJECT • 02354.20
DATE: 6.3.2018

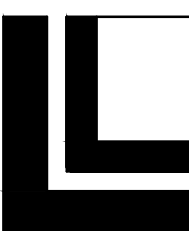


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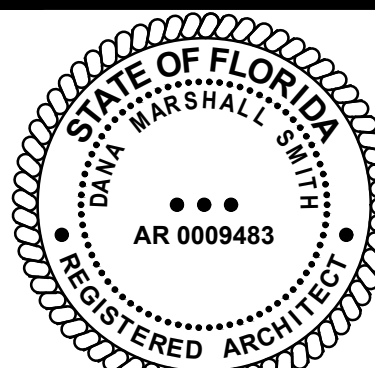
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SHEET TITLE

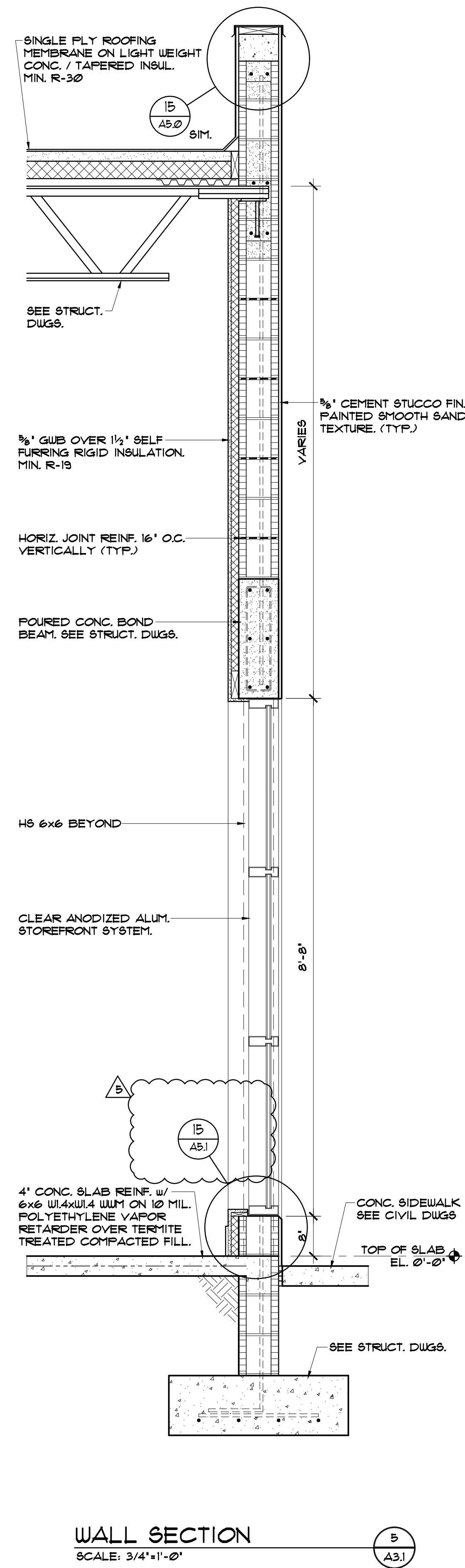
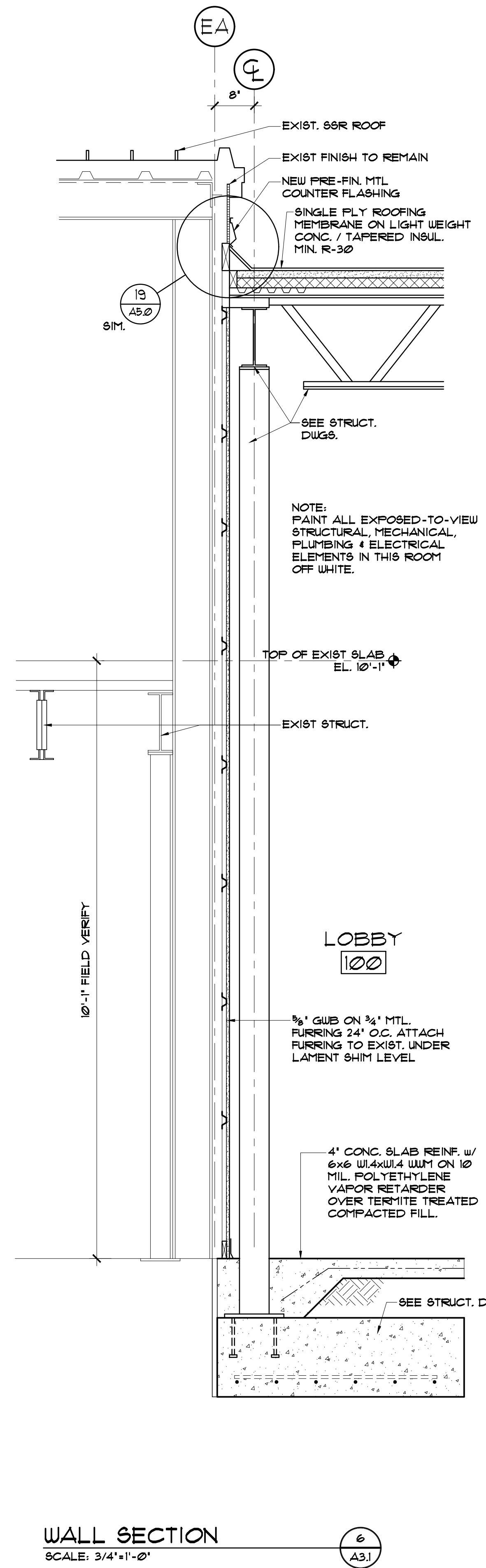
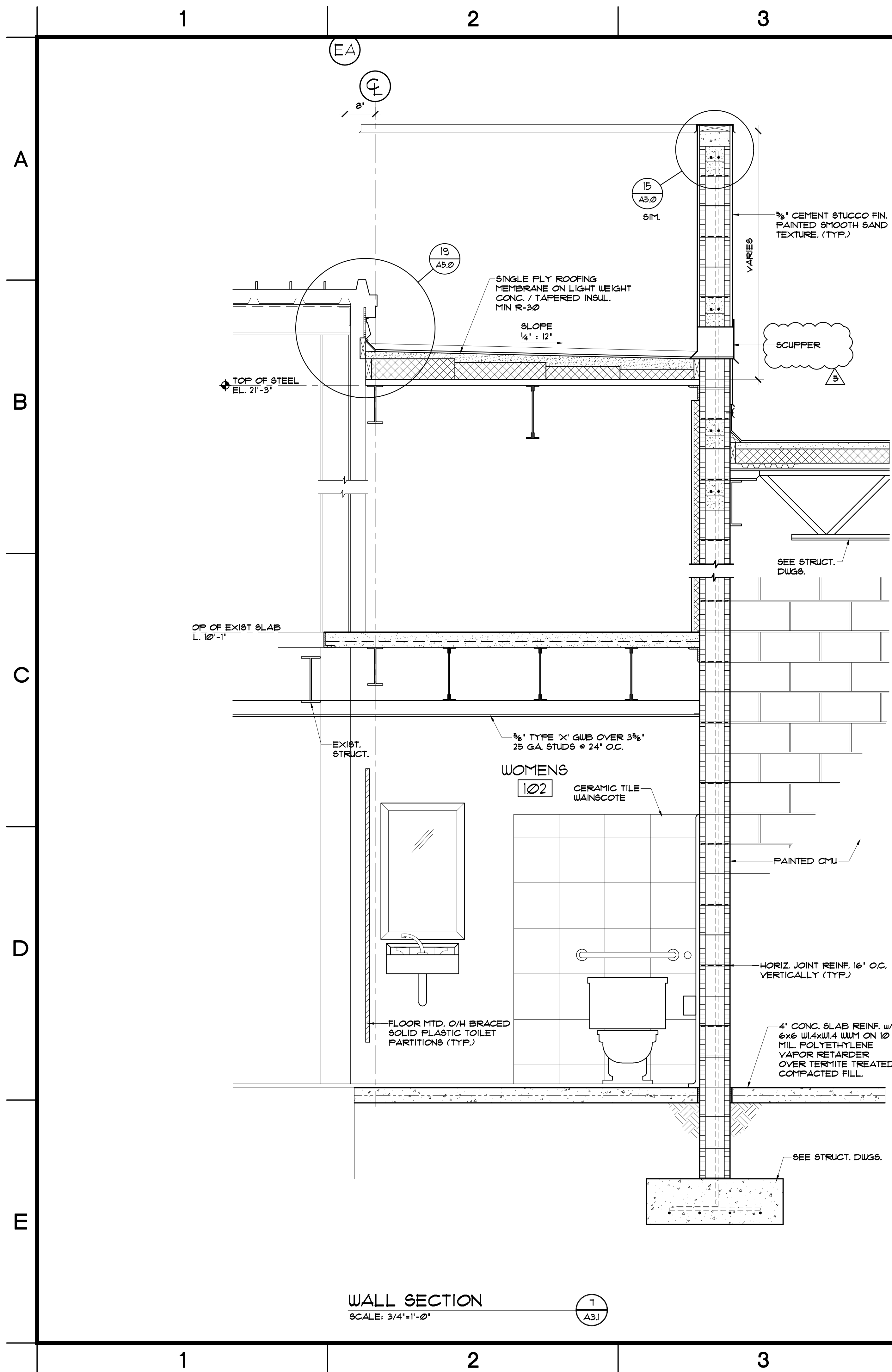
WALL SECTIONS



DANA M. SMITH
AR0009483

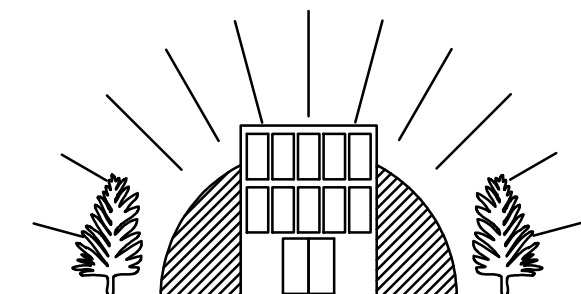
SHEET #
A3.0

PROJECT	02354.20	DATE:	6.3.2018
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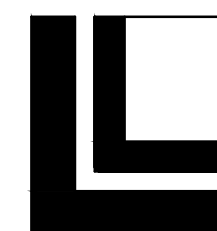
ARCHITECT.



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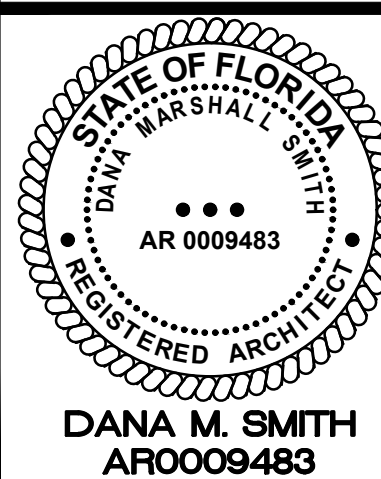
CONSULTANTS:

REV #	ISSUES / REVISIONS	DATE
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PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

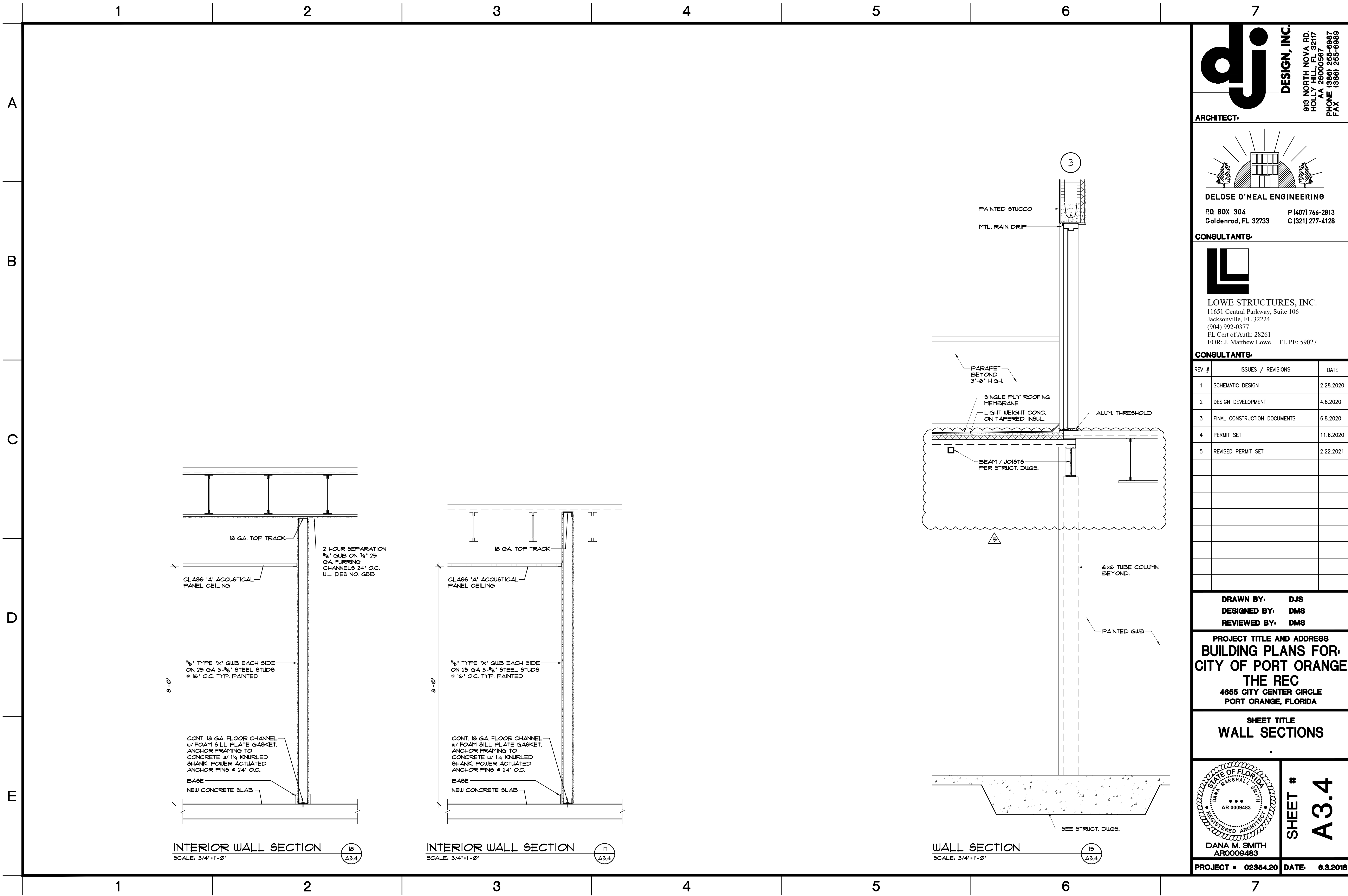
SHEET TITLE
WALL SECTIONS



DANA M. SMITH
AR0009483

PROJECT # 02354.20 DATE: 6.3.2018

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ARCHITECT.

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4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

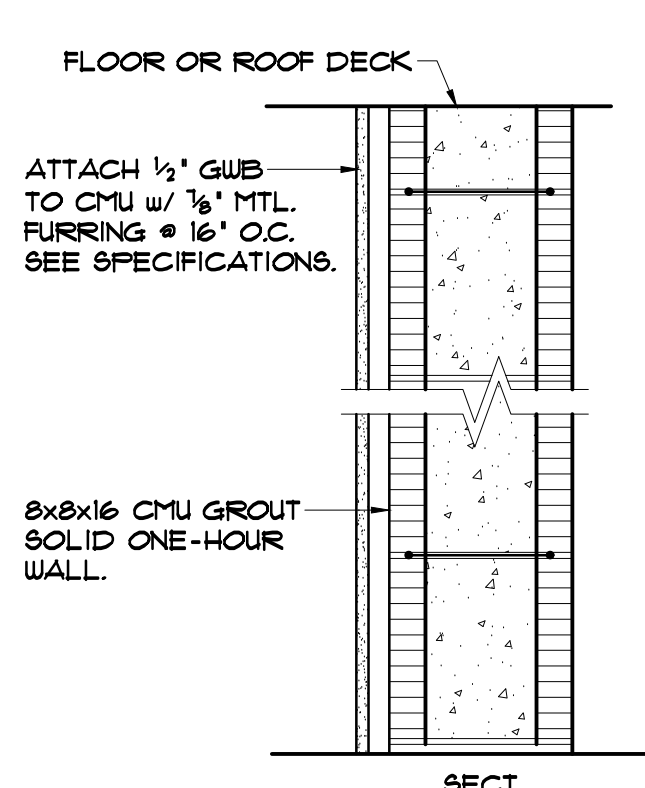
SHEET TITLE
WALL SECTIONS

STATE OF FLORIDA
DANA M. SMITH
AR 0009483
REGISTERED ARCHITECT

SHEET #
A3.4

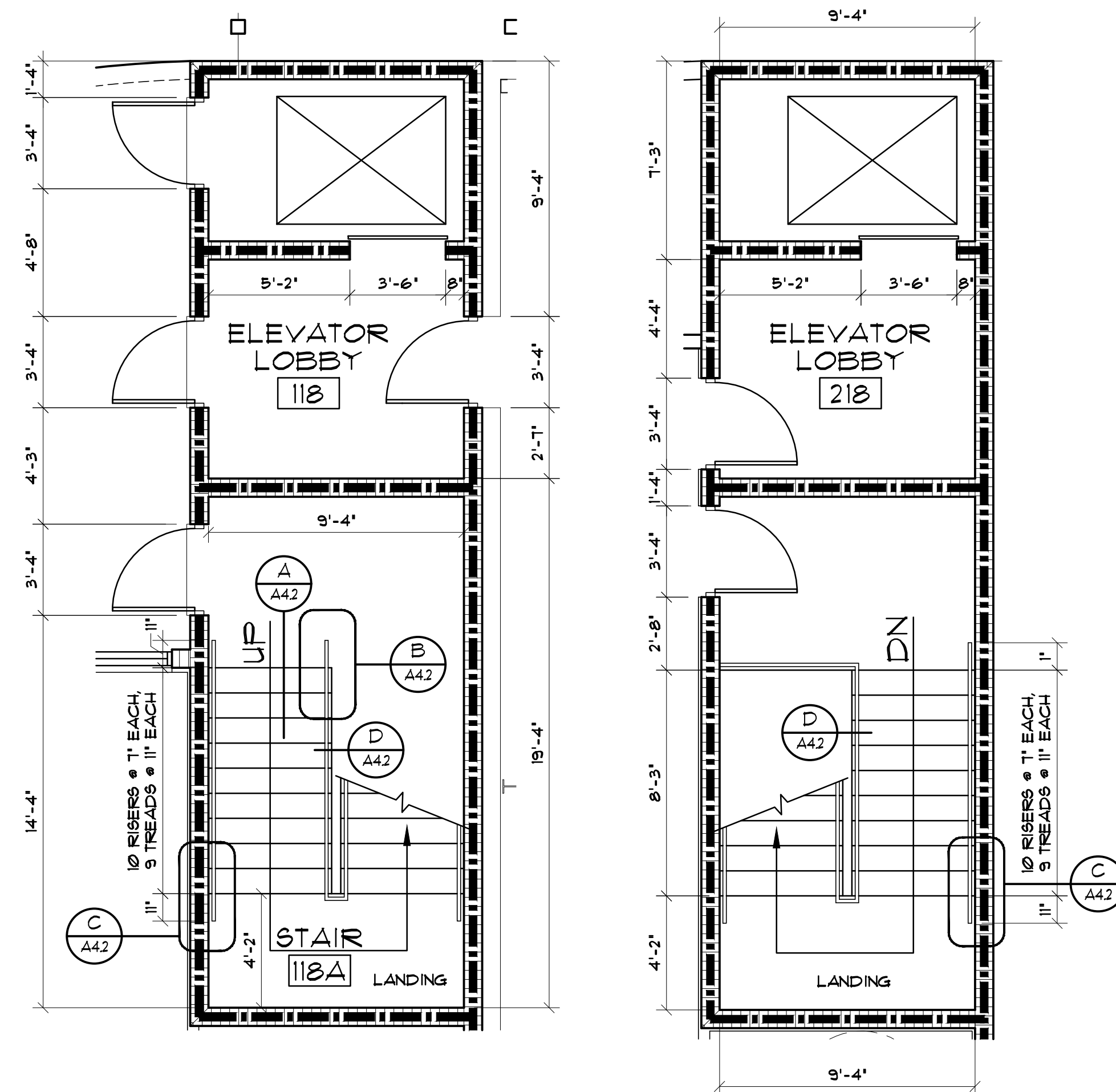
PROJECT • 02354.20

DATE: 6.3.2018

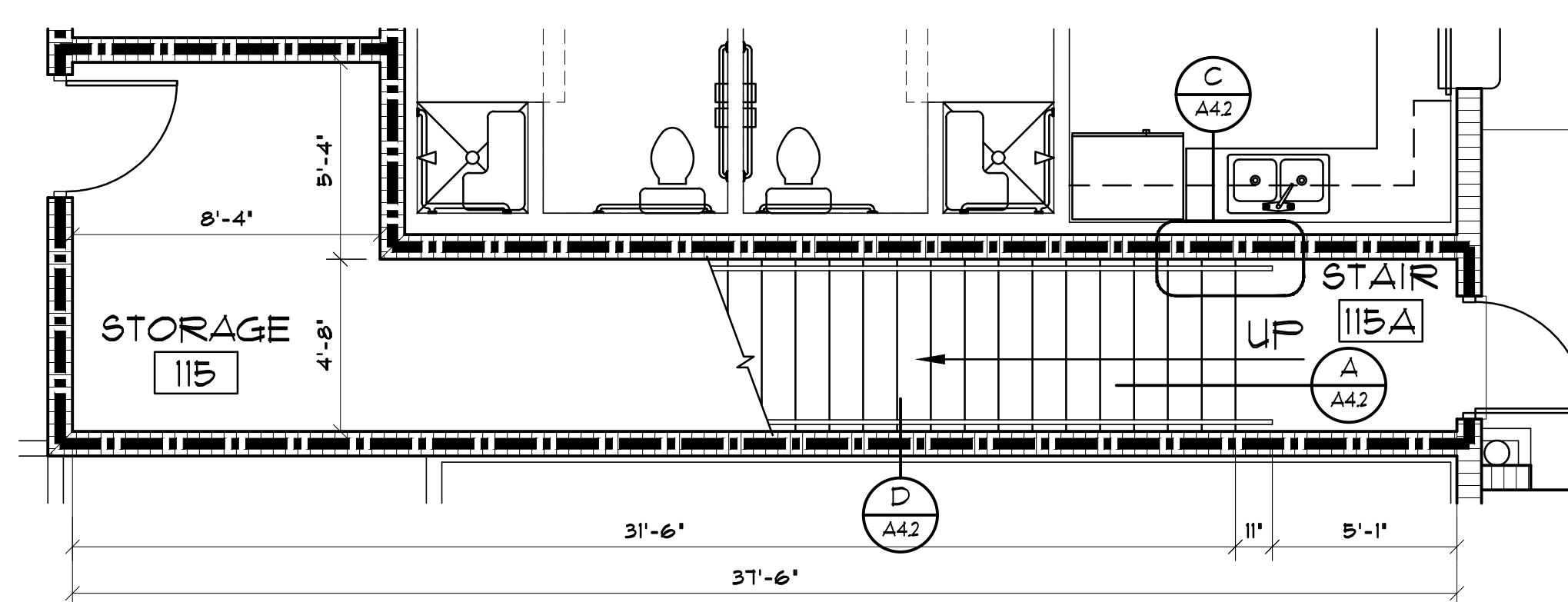
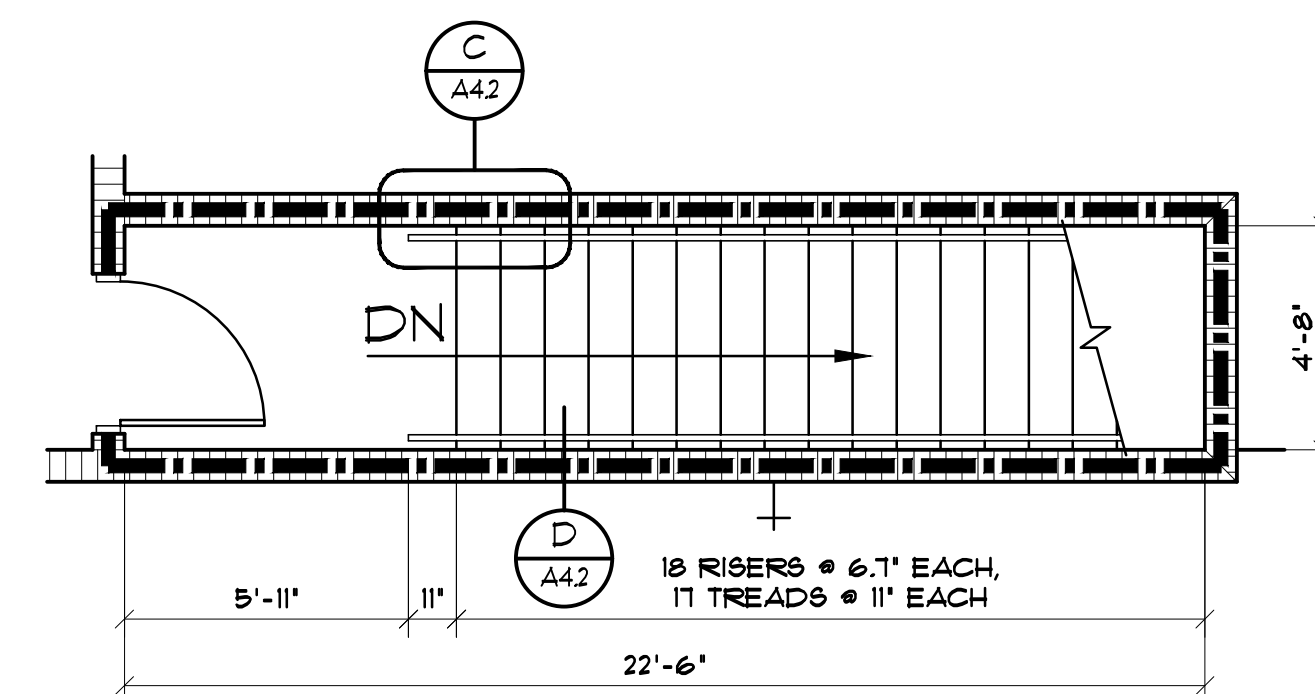


WALL TYPES

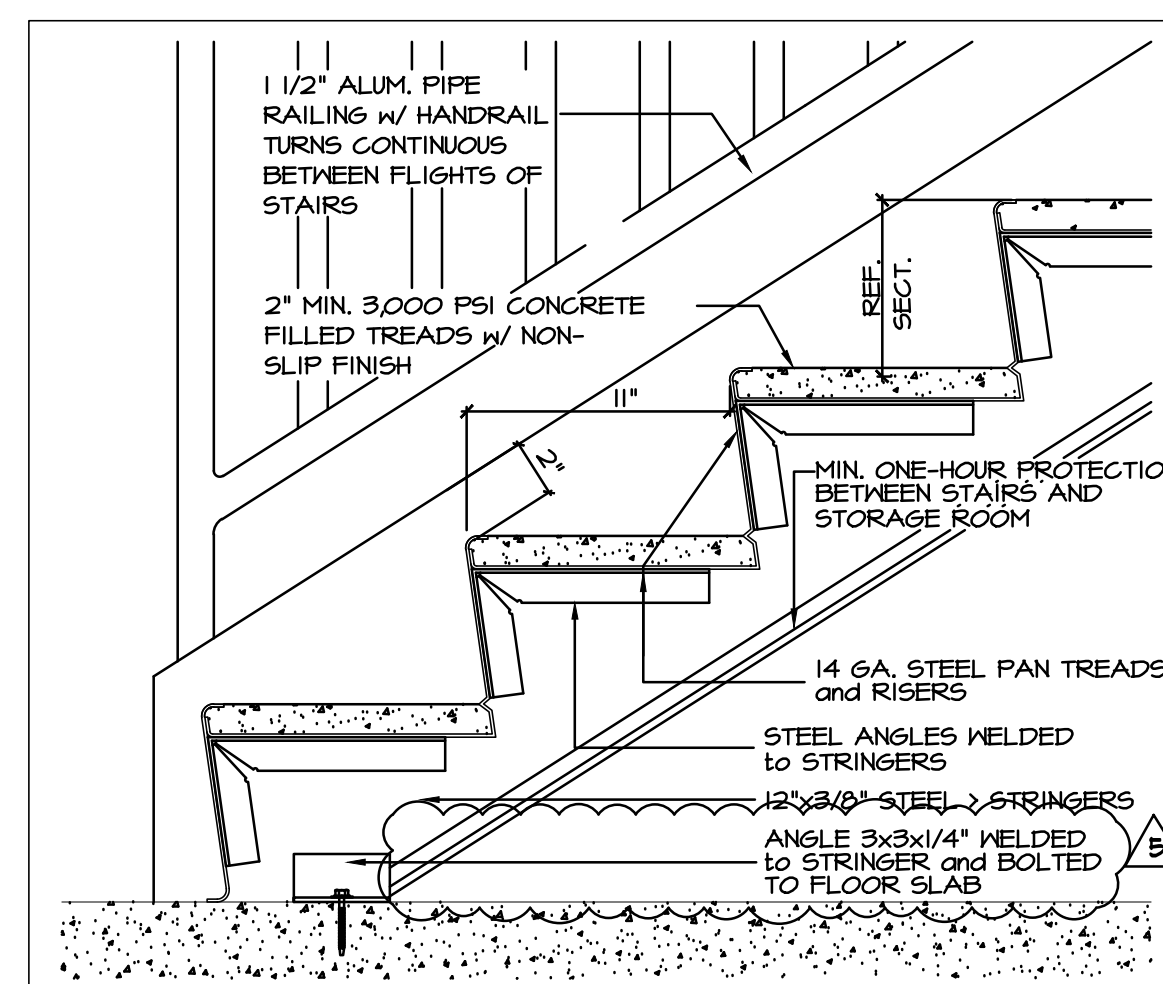
NO SCALE



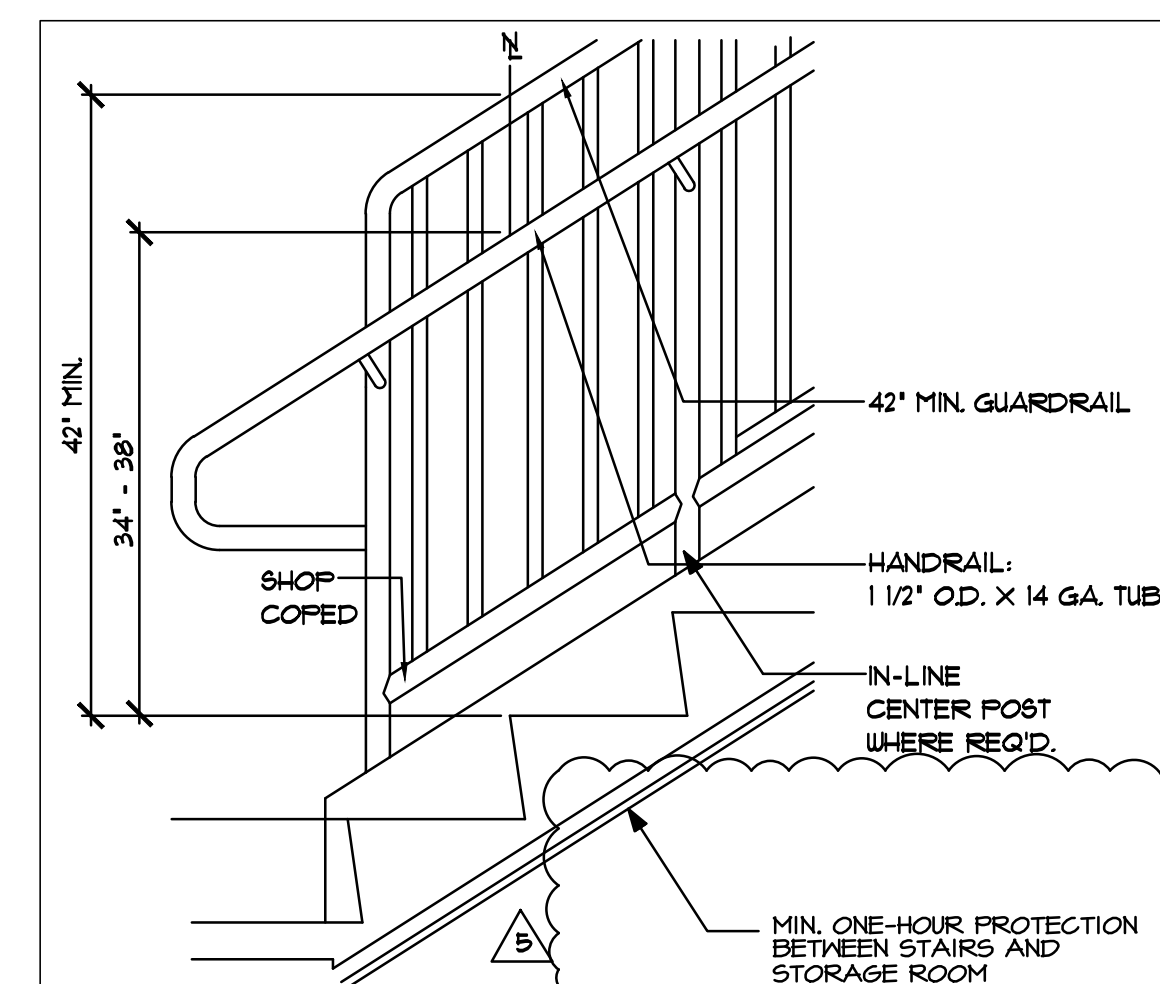
ENLARGED STAIR & ELEVATOR PLAN
SCALE: 1/4"=1'-0"



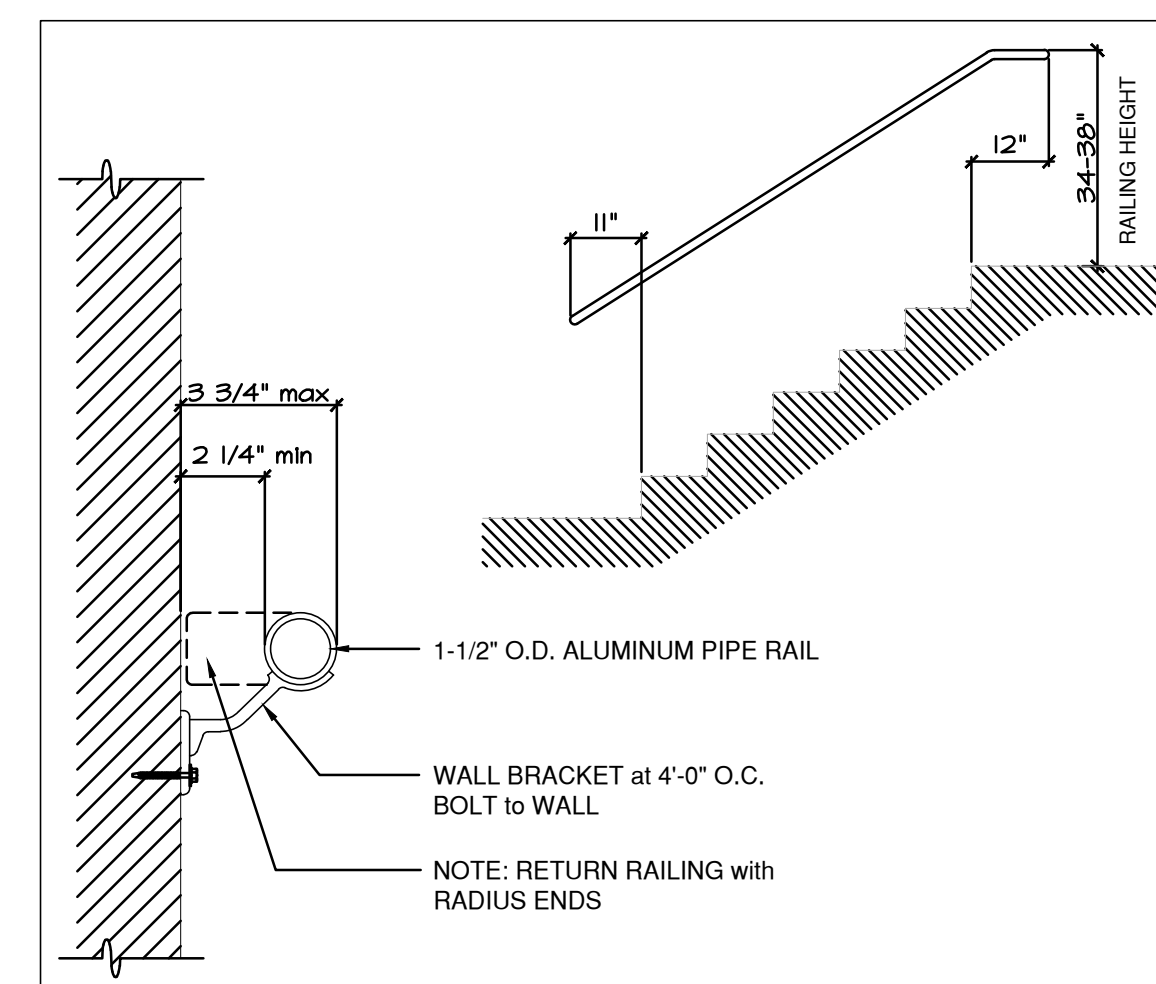
ENLARGED STAIR & ELEVATOR PLAN
SCALE: 1/4"=1'-0"



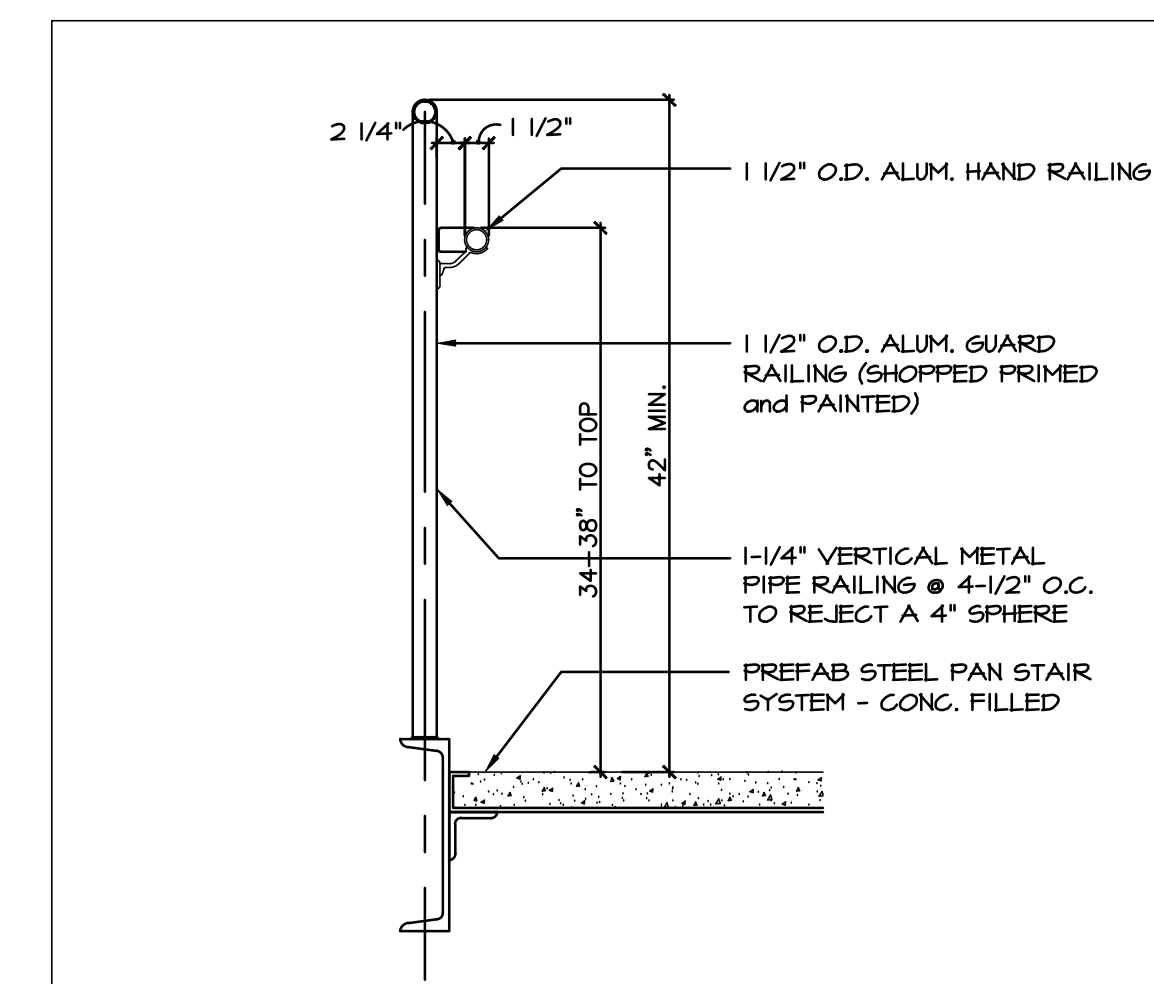
A	METAL PAN STAIRS SCALE: N.T.S.
---	-----------------------------------



B HAND RAIL DETAIL
SCALE: N.T.S.



C	HAND RAIL DETAIL SCALE: N.T.S.
---	-----------------------------------



D	GUARD RAIL DETAIL SCALE: N.T.S.
---	------------------------------------

STAIR DETAILS

NOT TO SCALE

3
A42

A

B

C

D

E

CROSS SECTION

SCALE: $\frac{3}{4}" = 1'-0"$

1
A4.3

A

E

E

[illegible]

Figure 1 shows diagrams of various door types and their glass requirements. The diagrams are labeled F, L, TL, LL, V, VL, Z, NL, G, GL, FG, FL, BP, BF, and OH. Each diagram shows a door with its dimensions and glass area requirements. A note states: "NOTE: MAX. AREA OF VISION GLASS FOR INTERIOR FIRE DOORS IN ONE-HOUR ENCLOSURES SHALL BE 100 SQ. IN."

[illegible]

NOTE:
ALL EXTERIOR WINDOWS SHALL BE IMPACT-RESISTANT LAMINATED
GLAZING IN CLEAR ANODIZED STOREFRONT FRAMING SYSTEM.

	EXTERIOR DOORS
	1-1-1 - 3 BUTT HINGES STOREROOM LOCKSET THRESHOLD WEATHERSTRIPPING DOOR STOP
	1-1-2 - 3 BUTT HINGES PASSAGE LOCKSET - ALWAYS OPENABLE FROM INT. CLOSER PANIC HARDWARE THRESHOLD WEATHERSTRIPPING
	1-2-1 - 6 FR BUTT HINGES STOREROOM LOCKSET-ALWAYS OPENABLE FROM INT. INACTIVE LEAF w/ HEAD / FLOOR PINS THRESHOLD WEATHERSTRIPPING
	1-2-2 - PIVOT HINGES 1 LOCKSET - ALWAYS OPENABLE FROM INT. PANIC HARDWARE THRESHOLD WEATHERSTRIPPING
	1-2-3 - PIVOT HINGES STOREROOM LOCKSET PANIC HARDWARE CLOSER w/ PANIC HARDWARE

2-1-1 - 3 BUTT HINGES
PRIVACY LOCKSET

2-1-2 - 3 BUTT HINGES 180° OPENING
STOREROOM LOCKSET

2-1-3 - 3 BUTT HINGES
PUSH / PULL
CLOSER
KICK PLATE BOTH FACES

2-1-4 - 3 BUTT HINGES
CLASSROOM LOCKSET

2-1-5 - 3 BUTT HINGES
ENTRANCE LOCKSET
ALWAYS OPENABLE FROM INT.

2-1-6 - 6 BUTT HINGES
STOREROOM LOCKSET-ALWAYS OPENABLE FROM INT.
INACTIVE LEAF W/ HEAD / FLOOR FINIS
ACTIVE LEAF WITH SURFACE ASTRAGAL

2-2-1 - 6 BUTT HINGES
PASSAGE LOCKSET
CLOSER WITH COORDINATOR
PANIC HARDWARE

2-2-2 - 3 BUTT HINGES
ENTRANCE LOCKSET
CLOSER
PANIC HARDWARE

1. ALL THRESHOLDS OF EXTERIOR DOORS SHALL BE NO MORE THAN 1/2" HIGH IN ACCORDANCE W/ THE FLORIDA BUILDING CODE - CHAPTER 11, ON HANDICAPPED ACCESSIBILITY.
2. ALL EXTERIOR DOORS SHALL BE MANUFACTURED IN ACCORDANCE W/ WIND PRESSURES NOTED ELSEWHERE IN THESE DRAWINGS AND WITH THE FLORIDA BUILDING CODE - CHAPTER 16.
3. ALL DOORS TO RECEIVE SILENCERS AND APPROPRIATE FLOOR OR WALL STOP.
4. VERIFY THAT LOCKING DEVICE IS INTEGRAL TO PANIC HARDWARE SUCH THAT UNLATCHING REQUIRES A SINGLE OPERATION IN ACCORDANCE WITH SECTION 1010.1.3.5 OF THE FBC-B
5. DOORS AND HARDWARE SHALL COMPLY WITH ALL APPLICABLE EGRESS FIRE PROTECTION AND ACCESSIBILITY REQUIREMENTS REPEATED IF THERE ARE ERRORS AND/OR OMISSIONS ON THE APPROVED PLANS.



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DELOSE O'NEAL ENGINEERING
P.O. BOX 304 P (407) 766-2813
Goldenrod, FL 32733 C (321) 277-4128

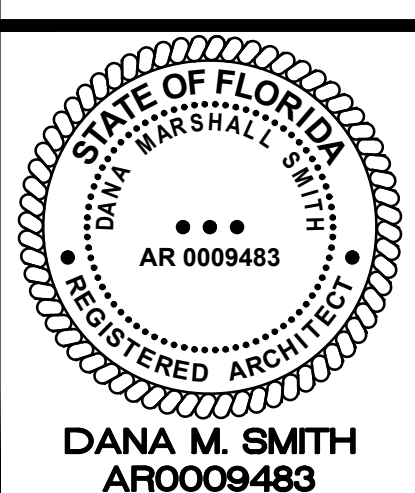
LOWE STRUCTURES, INC.
11651 Central Parkway, Suite 106
Jacksonville, FL 32224
(904) 992-0377
FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

[illegible]

DRAWN BY:	DJS
DESIGNED BY:	DMS
REVIEWED BY:	DMS

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
DOOR
SCHEDULE



SHEET #
A6.0

PROJECT • 02354.20	DATE 6.3.2018
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FINISH SCHEDULE

[illegible]

FINISH MATERIALS:

FLOOR

C - CARPET TILES:
 SF - SPORTS FLOOR
 CT - CERAMIC TILE
 RES - RESINOUS FLOOR
 E - EXISTING TO REMAIN
 SC - SEALED CONCRETE
 P - POLISHED CONCRETE
 T - ARTIFICIAL TURF

BASE

CT - CERAMIC TILE

E - EXISTING TO REMAIN
N - NONE
R - RUBBER BASE

FINISH NOTES

1. PAINT ALL NEW AND EXISTING DOORS AND FRAMES ON ALL SIDES.
2. IN SMALL UNNUMBERED ROOMS SUCH AS CLOSETS, STORAGE AREAS AND NOOKS, EXTEND FLOOR, WALL AND CEILING FINISHES OF THE CONTIGUOUS SPACES INTO THESE AREAS.

3. WALLS AND PARTITIONS WITHIN 2 FT. (610 MIN.) OF SERVICE (MOP) SINK, WATER CLOSET OR URINAL SHALL HAVE SMOOTH, HARD AND NON-ABSORBENT SURFACE, TO A HEIGHT OF NOT LESS THAN 4 FT. ABOVE THE FLOOR IN ACCORDANCE WITH SECTION 121022 OF FBCA. MATERIALS USED FOR SUCH WALLS SHALL BE OF A TYPE THAT IS NOT ADVERSELY AFFECTED BY MOISTURE, PAINTED GUB, INCLUDING EPOXY PAINT, WILL NOT MEET THAT CRITERIA.

WALL

CT - CERAMIC TILE
BASIS OF DESIGN:
DALTILE 'CITYVIEW' PORCELAIN

GL - EXISTING GLAZING TO REMAIN

FRP - FIBER REINFORCED PLASTIC WAINSCOT

N - NONE

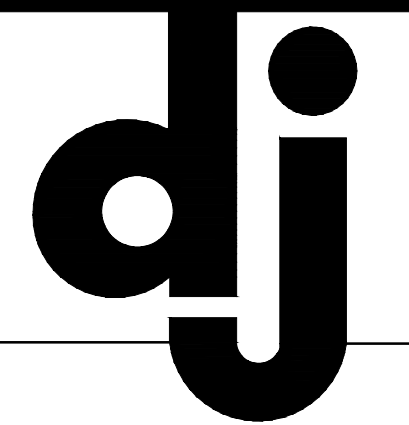
P CMU - PAINTED CMU

P - PAINTED GWB w/ MEDIUM ORANGE FEEL FINISH

PS - PAINTED STUCCO

CEILING

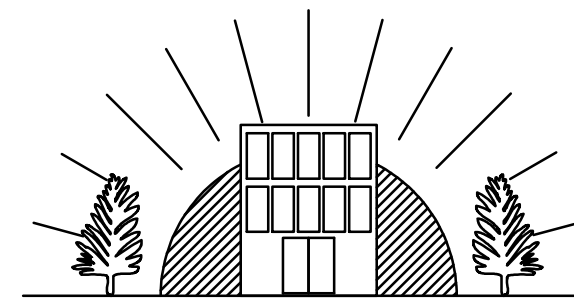
AP - ACOUSTICAL PANELS:
E - EXISTING TO REMAIN
EXP - EXPOSED
P - PAINTED GWB w/ MEDIUM ORANGE PEEL FINISH



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ARCHITECT.

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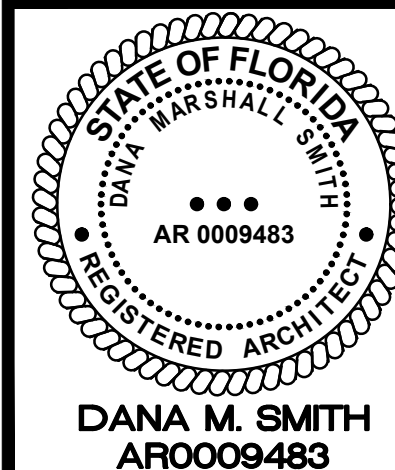
CONSULTANTS.

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DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
SCHEDULES



SHEET #
A6.1

PROJECT • 02354.20

DATE: 6.3.2018

	1	2	3	4	5	6	7	
A								
B								
C								
D								
E								
	1	2	3	4	5	6	7	

FINISH SCHEDULE										
RM. NO.	ROOM NAME	FLOOR	BASE	N. WALL	E. WALL	S. WALL	W. WALL	CEILING	CEILING HEIGHT	NOTES
201	ELEVATOR LOBBY	SC	R	P	P	-	-	AP	9'-0"	.
202	LOUNGE	LVT	R	-	P	P	-	AP	9'-0"	.
202A	RAMP	LVT	R	P	P	P	P	AP	9'-0"	.
203	TEEN LOUNGE	LVT	R	P	P	-	P	AP	9'-0"	.
203A	VESTIBULE	LVT	R	P	-	-	P	AP	9'-0"	.
204	MECHANICAL	SC	R	P	P	P	P	P	9'-0"	.
									.	.
206	MULTI-PURPOSE #1	LVT	R	P	P	P	P	AP	10'-0"	.
207	MULTI-PURPOSE #2	LVT	R	P	P	P	P	AP	10'-0"	.
208	VESTIBULE	LVT	R	P	P	P	P	P	8'-0"	.
209	PARENT LOUNGE	LVT	R	P	P	P	P	AP	9'-0"	.
210	CLOSET	SC	R	P	P	P	P	AP	8'-0"	.
211	TOILET	CT	CT	P	CT	P	P	P	8'-0"	6'-0" H. WAINSCOTE ON WET WALL
212	STAFF	CT	CT	P	P	P	CT	P	8'-0"	6'-0" H. WAINSCOTE ON WET WALL
213	CONFERENCE ROOM	CPT	R	P	P	P	P	AP	10'-0"	.
214	VESTIBULE	LVT	R	P	-	P	P	AP	9'-0"	.
214A	LOBBY	LVT	R	P	-	P	P	AP	9'-0"	.
214B	CORRIDOR	LVT	R	P	-	P	P	AP	9'-0"	.
214C	CLOSET	LVT	R	P	P	P	P	P	8'-0"	.
215	POLICE ATHLETIC LEAGUE	C	R	P	P	P	P	AP	8'-0"	.
216	BREAK-OUT 'A'	LVT	R	P	P	P	P	AP	8'-6"	.
217	BREAK-OUT 'B'	LVT	R	P	P	P	P	AP	8'-6"	.
218	ELEVATOR LOBBY	SC	R	P CMU	P CMU	-	P CMU	EXP	9'-0"	.
219	TOILET	CT	CT	P	P	CT	P	AP	8'-0"	6'-0" H. WAINSCOTE ON WET WALL
220	MECHANICAL	SC	R	P	P CMU	P	P	EXP	.	.
221	OFFICE	C	R	P	P	P	P	AP	.	.
222	BREAK-OUT 'C'	LVT	R	P	P	P	P	AP	8'-0"	.
223	BREAK-OUT 'D'	LVT	R	P	P	P	P	AP	8'-0"	.

FINISH MATERIALS:

FLOOR

- C - CARPET TILES;
PS - PAINTED STUCCO
CT - CERAMIC TILE
RES - RESINOUS FLOOR
E - EXISTING TO REMAIN
SC - SEALED CONCRETE
P - POLISHED CONCRETE
T - ARTIFICIAL TURF

WALL

- CT - CERAMIC TILE
BASIS OF DESIGN:
DALTILE 'CITYVIEW' PORCELAIN
GL - EXISTING GLAZING TO REMAIN
FRP - FIBER REINFORCED PLASTIC WAINSCOT
N - NONE
P CMU - PAINTED CMU
P - PAINTED GUB w/ MEDIUM ORANGE PEEL FINISH
PS - PAINTED STUCCO

CEILING

- AP - ACOUSTICAL PANELS;
E - EXISTING TO REMAIN
EXP - EXPOSED
P - PAINTED GUB w/ MEDIUM ORANGE PEEL FINISH

BASE

- CT - CERAMIC TILE
BASIS OF DESIGN:
DALTILE 'CITYVIEW' PORCELAIN
E - EXISTING TO REMAIN
N - NONE
R - RUBBER BASE

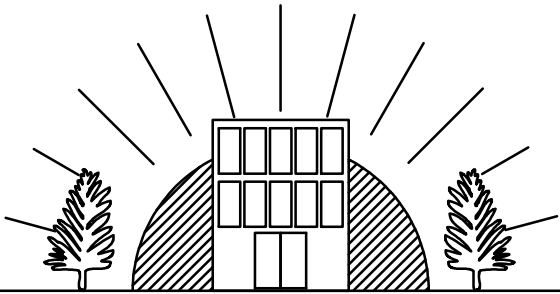
FINISH NOTES

1. PAINT ALL NEW AND EXISTING DOORS AND FRAMES ON ALL SIDES.
2. IN SMALL UNNUMBERED ROOMS SUCH AS CLOSETS, STORAGE AREAS AND NOOKS, EXTEND FLOOR, WALL AND CEILING FINISHES OF THE CONTIGUOUS SPACES INTO THESE AREAS.
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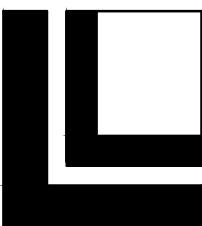
ARCHITECT.



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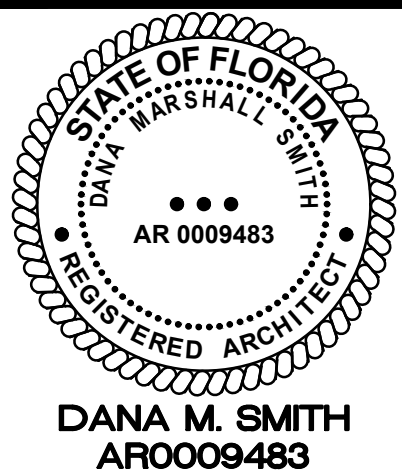
CONSULTANTS:

REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.6.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.8.2020
4	PERMIT SET	11.6.2020
5	REVISED PERMIT SET	2.22.2021

DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
SCHEDULES



SHEET #
A6.2

PROJECT # 02354.20 DATE: 6.3.2018



CITY OF PORT ORANGE

PURCHASING DIVISION
1000 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA 32129
TELEPHONE 386-506-5704
purchdiv@port-orange.org

ADDENDUM NO. #1

March 30, 2021

ITB #21-13 Renovation and Expansion of the REC

To All Bidders:

The following changes, clarifications and additions are hereby made part of the bidding and specifications for the above referenced project dated March 12, 2021 and prepared by the City of Port Orange Purchasing Division as fully and completely as if the same were fully set forth therein. It is the sole responsibility of bidder to confirm that all addenda have been received prior to submitting bid and acknowledge such in the bid documents.

A. CLARIFICATIONS

1. After review by the department and project engineer, the following product: ***Taraflex Sport M+***, has been deemed acceptable as an alternate under Section 096516, 2.1 (A).
2. After review by the department and project engineer, the following product: ***SIKA***, has been deemed acceptable as an alternate KEE product.
3. The Port Orange REC will be **open and available** to interested bidders from **12pm-2pm, Monday through Friday (*excluding Holidays*)**. Please check in with the front desk, and let them know why you are there, and City Parks and Recreation staff will provide you access to the facility.

B. CHANGES TO SPECIFICATIONS

1. The following link has been added to Section 3 via this Addendum No. 1 with access to all pertinent drawings for the project:
<https://portorange.sharepoint.com/:f:/g/pch/EndENGElQRxLnd85KRgMtkgB03M62C3W6sfU2722OJvANw?e=dBh0Rp>
2. Section 096519, 2.1 shall now read ***"Luxury Vinyl Floor Tile"***.
3. Section 096519, 2.1, Item 1 shall now read ***"Shaw Contract"***.
4. Section 096519, 2.2, Item 1 shall now read ***"Shaw Contract"***.

C. QUESTIONS AND ANSWERS

Question 1: What is the estimated budget for this project?

Answer: The estimated budget for the project is \$3,000,000.00.

Question 2: What is the anticipated start and final completion date?

Answer: June 1, 2021 start date with a final completion date of April 1, 2022.

Question 3: Is the City furnishing any materials? If so, please list the items.

Answer: No.

Question 4: Who contracts and pays for third party independent testing? Please clarify.

Answer: The general contractor.

Question 5: Are there any DBE/WMBE goals?

Answer: No.

Question 6: What are the working hours for the contractor?

Answer: 7am-7pm Monday through Friday. No holidays. Weekend work can occur with written permission.

Question 7: Due to COVID-19, will the City accept electronic bid submissions?

Answer: No, the City is not accepting electronic bid submissions. Please ensure to include a USB Flash Drive or CD with your physical submission.

Question 8: Do we need to include building permit and impact fees in our bid?

Answer: Yes, all fees. The General Contractor is to pay for all applicable permits/fees.

Question 9: What is the last date for questions?

Answer: The last day for questions is April 5th, 2021. Please familiarize yourself with the ITB document.

Question 10: What is the process for accepting/equal manufacturers/products?

Answer: Contractor submits the request/information to Purchasing. Purchasing will forward the request/information to the department and the Engineer for review and determination. Purchasing will notify the contractor of the decision. Should it be accepted, Purchasing will add as a clarification to an Addendum.

Question 11: Does this project require Davis-Bacon wages/rates?

Answer: No.

Question 12: Does this project require E-Verify?

Answer: Yes, please see Section 5, Item 36 on Page 652 of the ITB. Please familiarize yourself with the ITB document.

Question 13: What are the liquidated damages?

Answer: \$500 per day. Please see AIA contract document, on Page 699 of the ITB.

Question 14: 102800 Toilet Accessories - The specifications state that the owner will provide the Toilet Paper Dispensers, Soap Dispenser and Paper Towel Dispensers (1.1-B). The legend on the plans state Owner Supplied and Contractor Installed (A4.0). Then your ITB had Alternate #4 that wants automatic Soap Dispensers and Paper Towel Dispensers (which model numbers will be required). So, with all of the confusion, how are we to quote this section?

Answer: Contractor will provide and install.

Question 15: 104416 Fire Extinguishers - The specification specifies the ABC extinguisher and the CD extinguishers. The plans does not state which type should be used in the locations indicated on the plans. Please have it clarified which type of extinguisher should be used in each location. On sheet A5.0, elevation 9 shows an extinguisher and cabinet mounting, will cabinets be required? Also, please confirm that only 4 extinguishers will be required for this project.

Answer: This is shown on the life safety plan and we only request ABC. Yes, cabinets are required.

Question 16: 105113 Metal Lockers - The specification is not clear on what is required for the project, generic spec. The specs and plans does not give any information (elevations) on how many Tiers the lockers are to be. Please have the architect/owner clarify what will be required. Also, the specification has information about Benches, but the plans does not show them. Will they be required, if so, where and what size?

Answer: Contractor will not be required to provide and install the lockers. The City will take care of the lockers.

Question 17: Is there an interior and exterior signage scope involved? Please confirm.

Answer: Yes, interior. There is a sign on every door with a room number.

Question 18: It appears that the structural drawings are missing. Please provide them, if missing, so we can price Steel, Concrete, and Masonry Scopes.

Answer: Please see the link to all drawings under B. CHANGES TO SPECIFICATIONS #1.

Question 19: Are there any Civil Drawings associated with this project, and a Soils Report?

Answer: Please see the link to all drawings under B. CHANGES TO SPECIFICATIONS #1.

Question 20: Do you have Formal Bid Forms, or Excel Bid Breakdown Form?

Answer: There is a Bid Form Submittal Checklist in the ITB under Section 7, Required Forms.

Question 21: The plans reference civil plans, but none have been provided. Can the City provide the civil plans?

Answer: Please see the link to all drawings under B. CHANGES TO SPECIFICATIONS #1.

Question 22: Regarding Fire Extinguishers: Specs call out for ABC Extinguisher and CD Extinguishers. Plans do not state which type should be used in the locations indicated on the drawings. Which type should be used?

Answer: Please see the answer to Question 15.

Question 26: Sheet A5.0, Elevation 9 shows an extinguisher and cabinet mounting, will the cabinets also be required?

Answer: Please see the answer to Question 15.

Question 27: Can the City provide Fire Protection drawings as they are missing although indicated on cover page/sheet?

Answer: Please see the link to all drawings under B. CHANGES TO SPECIFICATIONS #1.

Question 28: The specs suggest signage, but no indication of scope is shown on the plans. Is signage required for this project?

Answer: Please see the answer to Question 17.

Question 29: The specifications and drawings do not indicate the locker type. Can the City specify if they are 1-tier, 2-tier, 3-tier, 4-tier, 5-tier or 6-tier? Please also specify locker size or confirm if it is 12" wide and 18" deep.

Answer: Please see the answer to Question 16.

Question 30: Will we be required to pay for tap fees?

Answer: Yes.

Question 31: Has Florida Power and Light viewed these plans? Will there be any associated fees regarding this?

Answer: No, they have not. The site will have a new transformer.

Question 32: Will the site be functional and occupied while the contractor is working?

Answer: No.

Question 33: Will the playground be provided by the City?

Answer: No, it is an additive alternate and will be awarded based on budget; include it in your bid submittal.

Question 34: Are there specifications on the type of playground equipment/brand?

Answer: We don't specify brands. We ask that all playgrounds be IPEMA certified. They need to be suitable for ages 2-5 and then ages 5 and up.

Question 35: Will there be civil design drawings?

Answer: Yes, there are civil and landscape drawings.

Question 36: Is there grant money tied to this project?

Answer: Yes, this project is partially funded by Volusia ECHO Grant funding.

Michael Hall
Purchasing Agent
mhall@port-orange.org

In all other respects, except as specifically stated herein, the subject ITB #21-13 Renovation and Expansion of the REC remains unchanged.

END OF ADDENDUM NO. #1



CITY OF PORT ORANGE

PURCHASING DIVISION
1000 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA 32129
TELEPHONE 386-506-5704
purchdiv@port-orange.org

ADDENDUM NO. #2

April 12, 2021

ITB #21-13 Renovation and Expansion of the REC

To All Bidders:

The following changes, clarifications and additions are hereby made part of the bidding and specifications for the above referenced project dated March 12, 2021 and prepared by the City of Port Orange Purchasing Division as fully and completely as if the same were fully set forth therein. It is the sole responsibility of bidder to confirm that all addenda have been received prior to submitting bid and acknowledge such in the bid documents.

A. CLARIFICATIONS

Acoustical Ceiling materials for the project; Manufacturer, Color Type and Size:
Please refer to See Section 095113, 2.2B thru 2.2K.

Model numbers required for question 14, Addendum No.1, "102800 Toilet Accessories":
*The user has decided to make the GC responsible for providing (furnishing and installing) the Toilet Accessories as scheduled on the Toilet Accessories Legend, Sheet A4.0 as the Base Bid. Alternate #4; **Bobrick** B72974 Automatic, surface-mounted paper towel dispenser and **Bobrick** B-2012 Automatic, wall-mounted soap dispenser.*

Please note the following is related to Elevator Specifications:

1.5; Calls for 60 months of preventive maintenance to be included. This is typically 12 months since it would be an operating cost not a capital cost. Please advise if this should be 12 months.
Length of time is 12 months.

2.6.A.2; calls for various wall and car door finishes. Also, in 2.9.A.4.g – calls for Enamel car door, 2.9.A.4.f calls for laminate walls. Please define the requirement for this project.
Requirements are Stainless steel doors, laminate walls.

2.7.B.1; Calls for various finishes for hoistway entrance doors and frames. Also noted in 2.9.A.5.e.
Stainless steel door frames, No. 4 finish.

2.9.A.3 – Calls for 200 fpm. This is not possible in 11'8". Recommend 100 fpm. Please confirm requirement.
100 fpm will suffice.

Please note the following is related to Drawing A3.3

Hoistway size of 9'4" w is beyond standard design width for all manufactures. Min. is 8'6" and max. is 9'0". Either design change or additional structural supports will be needed.
Final, approved shop drawings will set the hoistway dimensions prior to construction.

Overhead of +/- 12'-0" insufficient. Need 12'-8" minimum clear. Hoist beam to be by others and needs to be installed during hoistway construction.

Final, approved shop drawings will set the hoistway dimensions prior to construction.

No detail for East elevator. Hoistway depth due to front and rear configuration needs to be 6'5 5/8".

Final, approved shop drawings will set the hoistway dimensions prior to construction.

B. CHANGES TO SPECIFICATIONS

N/A

C. QUESTIONS AND ANSWERS

Question 1: Can you confirm if this project requires exterior site furnishings such as benches, trash receptacles, bike racks, etc.?

Answer: There are no requirements for exterior site furnishings.

Question 2: Sheet A5.1 detail 3: How is the exterior of the column finished?

Answer: The exterior of the steel column has a stucco finish.

Question 3: Roof Insulation: Cross section C / A4.1, wall section 14 / A 3.3 and Detail 13 / A 5.0 appear to show the roof insulation to be rigid and not LWIC. Should this roof be LWIC?

Answer: Since the roof structure itself slopes, we do not need lightweight concrete to create slope-to-drain. Rigid insulation with a nailable surface must achieve a R-30 insulative value.

Question 4: How deep is the tube frame work for the clear aluminum grates, I see they are 1-1/2" W but don't have the depth.

Answer: 6".

Question 5: How thick is the 1"W grate screen to be for the clear anodized aluminum grating? It appears to be 3/8" -1/2"

Answer: 1/2".

Question 6: Can the grate screen for the clear anodized aluminum grates be a separate screen that bolts onto the screen framework? This would keep costs down and eliminate any exposed weld/ grind marks that would be visible otherwise.

Answer: Yes.

Question 7: Are the 3 screens on the east elevation and the 3 on the north elevation seen on drawing A2.0 the only aluminum grates within the project?

Answer: Yes.

Question 8: Specification Sheet E5.1 Detail 3 where it shows attaching a copper system to a metal standing seam roof. The UL 96A Code states to not utilize dissimilar metals. NFPA 780 clearly states in Code 4.2.3 Lightning protection materials shall not be installed on or in contact with aluminum siding or other aluminum surfaces. Code: 4.2.4 states Aluminum lightning protection materials shall not be installed on or in contact with copper surfaces. This is pretty well known, in the industry due to it causing corrosion (Oxidation).

Answer: Dissimilar metals shall be separated by isolation tape or asphaltic coating.

Question 9: With the existing “MDP “being removed and a new one being installed we assume this the building will be without power for three (3) or more days? Or has this been addressed in sequence of work to be performed?
ANSWER: Keeping the building powered during construction was not a request made during design. It is assumed the building will be without power for the duration of the electrical switchover.

Question 10: Sheet ES1.1 – Note # 5 indicates “ Provide in grade box for electrical power feed “, but these could be FPL conduits that feed the existing MDP , so if that is the case then we are not allowed to install Junction boxes or the new conduits? It appears that the FPL transformers are pole mounted and feeds to a underground handhole that is FPL’s. This needs to be clarified more as to what needs to be included in the EC bid.
ANSWER: This will need to be coordinated with FPL. Past experiences with FPL in Volusia county have had the contractor install the handhole, conduit, and wiring. FPL would provide and install the riser, and terminate the cabling.

Question 11: Sheet E6.0 – What are the existing Conduit and Wire sizes that feed from FPL to the existing “MDP “? The new single line diagram riser indicates that we are to install “ 2 parallel sets of (4) # 350KMCIL “ copper to the new MDP , so are these new conduits or are we installing through the existing raceway after we intercept and install new?
ANSWER (2 parts):

Demolition

The contractor shall intercept the existing underground electrical service feeder at the handhole located at the base of the existing power pole and transformer. The contractor shall remove the existing underground power feed from the existing handhole to the existing service meter.

New Work

The contractor shall install an FP&L provided handhole adjacent to the power pole. It's possible the existing handhole may be re-used, but that will be for FP&L to determine. The contractor shall purchase and install (2) parallel sets of 4" Conduit from the handhole to the new service meter. Contractor shall purchase and install a pull box for the electrical feeder, as this run is roughly 375'. Conductor sizes as indicated on sheet E6.0, with the service grounding conductor revised to #2/0. Contractor shall purchase and install cable, FP&L will terminate. FP&L will provide and install the pole riser if the existing riser is not adequate for the new service.

Question 12: Should permits / fees be carried in our proposal as an allowance?

ANSWER: Per Addendum No.1, Question/Answer 8 as follows:

Question 8: Do we need to include building permit and impact fees in our bid?

Answer: Yes, all fees. The General Contractor is to pay for all applicable permits/fees.

Question 13: What is the approximate Building Permit Cost? If not available, is there a metric we should use to calculate this cost?

Answer: Please use this link to access the Building Permit Fees Table:

<https://www.port-orange.org/DocumentCenter/View/3312/Building-Permit-Fee-Schedule-Resolution-Number-13-30-and-20-14-PDF>

In all other respects, except as specifically stated herein, the subject ITB #21-13 Renovation and Expansion of the REC remains unchanged.

END OF ADDENDUM NO. #2

Joseph Castro

Buyer

jcastro@port-orange.org

EXHIBIT “A”

Insurance and Bond

Consisting of 5 Pages

Insurance

Standard Insurance Requirements									
	Insurance	Standards	Additional Requirements						
☒	Workers' Compensation The Contractor shall maintain coverage for its employees with statutory workers' compensation limits, and no less than the limits indicated in the Schedule of Limits for Employers' Liability. Said coverage shall include a waiver of subrogation in favor of the City. The City will not accept elective exemptions. Any contractor using an employee leasing company shall complete the Leased Employee Affidavit (Exhibit A).	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><u>Contract Amount</u></td> <td style="width: 50%; border: none;"><u>Limits</u></td> </tr> <tr> <td style="border: none;">Up to \$10 million</td> <td style="border: none;">Statutory/\$500,000</td> </tr> <tr> <td style="border: none;">\$10 - \$20 million</td> <td style="border: none;">Statutory/\$1,000,000</td> </tr> </table> Contracts over \$20 million To Be Determined by the City.	<u>Contract Amount</u>	<u>Limits</u>	Up to \$10 million	Statutory/\$500,000	\$10 - \$20 million	Statutory/\$1,000,000	☐ If Contract requires work on or about navigable waters, Longshoreman's and Harbor Workers' Coverage required. ☐ If vessels involved, Jones Act coverage with limits of \$500,000 required.
<u>Contract Amount</u>	<u>Limits</u>								
Up to \$10 million	Statutory/\$500,000								
\$10 - \$20 million	Statutory/\$1,000,000								
☒	Comprehensive General Liability (including Completed Operations and Contractual Liability)	<u>Limits:</u> Combined Single Limit Bodily Injury and Property damage \$1,000,000 occurrence \$1,000,000 aggregate	☐ When work is on or under Railroad rights of way or properties, the Contractor shall take out and maintain during the life of the Contract, Railroad protective liability and property damage insurance in amounts as requested by the Railroad.						
☒	Comprehensive Business, Automobile Liability to include all owned, hired and non-owned automobiles.	<u>Limits:</u> Auto Liability Body Injury and Property Damage: \$1,000,000 each occurrence \$1,000,000 aggregate							
Additional Insurance Requirements									
☒	Property Insurance Builders Risk. <u>Additional Coverage:</u>	Limits: Buildings - Completed value of Contract. "All Risk" coverage on latest ISO for or its equivalent. Permission granted to occupy. Owner named as insured AIMA	If Agreement requires handling or installation of Owner's equipment, coverage should be furnished on "All Risk" form, including transit and Owner shall be named.						
☐	Professional Liability	Limits: Coverage - \$1,000,000							
☐	Installation Floater (IT)	Limits: Coverage - \$ <u>To be determined.</u>							
☐	Contractor Pollution Liability	Limits: Coverage - \$1,000,000							
☐	Errors and Omissions	Limits: Coverage - \$1,000,000							
☐	Umbrella Policy	Limits: Coverage – \$ <u>To be determined.</u>							
☒	Payment and Performance Bond Required	Limits: Coverage - Equal to amount of Contract.							
☐	City Manager waives Payment and Performance Bond for work under \$25,000.00.								
☐	Unless otherwise required by law, City Manager waives Insurance for FOB goods under \$25,000.00								

FRONT PAGE FOR BOND REQUIRED BY SECTION 255.05, F.S.

PAYMENT AND PERFORMANCE BOND

(Public Works)

Notice and Time Limitations Must Be In Accordance
With Section 255.05(2), (8) and (10), Florida Statutes

BOND NO. _____

PRINCIPAL:

Developer or Contractor: Saboungi Construction, Inc.
Principal Business Address: 290A North US Highway 1
Ormond Beach, Florida 32174
Contact Person: Hassan Saboungi, Vice President
Phone Number: (386) 672-2077

SURETY:

Address: _____

Contact Person: _____
Phone Number: _____

OWNER:

City of Port Orange, Florida, a chartered municipal corporation
1000 City Center Circle
Port Orange, Florida 32129-4144
Contact Person: City Manager
Phone Number: (386) 506-5501

CO-OBLIGEE:

County of Volusia, a political subdivision of the State of Florida
123 West Indiana Avenue
DeLand, Florida 32720
Contact Person: County Manager
Phone Number: (386) 736-2700

Amount: \$3,963,162.00 City Project Number: ITB 21-13 Renovation and Expansion of The Rec

Description of Work: Renovation and Expansion of The Rec

Project Location: 4655 City Center Circle, Port Orange, Florida 32129

Legal Description: 4655 City Center Circle, Port Orange, Florida 32129
See Exhibit "A"

Front Page

All other pages are subsequent to this page regardless of any numbers that may be printed thereon.

**City of Port Orange The Rec
4655 City Center Circle, Port Orange, FL 32129**

Full Parcel ID:
08-16-33-00-06-0010

Short Parcel ID:
6308-00-06-0010

Legal Description:
A portion of the Parcel ID listed above.

EXHIBIT "A"

Saboungi Construction, Inc.

ITB 21-13 Renovation and Expansion of The Rec

Bond No. _____

COMBINATION PAYMENT AND PERFORMANCE BOND FOR PUBLIC CONSTRUCTION

per Section 255.05, Florida Statutes
Guaranty for Construction of Public Improvements

BY THIS BOND, We, **Saboungi Construction, Inc.**, as Principal, and _____, a corporation, as Surety, are bound to **CITY OF PORT ORANGE, FLORIDA**, a Florida municipal corporation, herein called "Owner" or sometimes referred to as "City" and **COUNTY OF VOLUSIA**, a political subdivision of the State of Florida "Co-Obligee," in the sum of **THREE MILLION NINE HUNDRED SIXTY-THREE THOUSAND ONE HUNDRED SIXTY-TWO AND 00/100 DOLLARS (\$3,963,162.00)**, for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the terms of that certain AIA Contract, having an effective date of _____, entered into by and between the Principal and the City, for Renovation and Expansion of The Rec, hereinafter referred to as the "Contract," being made a part of this bond by reference, at the times and in the manner prescribed in the Contract; and
2. Promptly makes payments to all claimants, as defined in Section 255.05(1), Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the Contract (the "Work"); and
3. Pays Owner all losses, damages, delay damages (including contractually authorized liquidated damages), expenses, costs, and attorney's fees, including appellate proceedings, that Owner sustains because of a breach or material breach by Principal under the Contract documents; and
4. Performs the guarantee of all work and materials furnished under the Contract for the time specified in the Contract, then this bond is void; otherwise it remains in full force.

Notice of Nonpayment and Time Limitations

Any action instituted by a claimant under this bond for payment must be in accordance with the notice and time limitation provisions in Sections 255.05(2), (8) and (10), Florida Statutes.

Any changes in or under the contract documents and compliance or noncompliance with any formalities connected with the contract or the changes does not affect Surety's obligation under this bond.

IN WITNESS WHEREOF, this performance and payment bond is executed and shall be deemed an original, this _____, day of _____, 2021.

Attest:

SABOUNGI CONSTRUCTION, INC.
(Principal)

(As to Corporate Principal) Secretary

By: _____
Hassan Saboungi, Vice President

(Witness to Principal)

(Corporate Seal)

(Surety)

(Witness to Surety)

By: _____
Name: _____
(Attorney-in-Fact)

(Corporate Seal)

NOTE: Date of BOND must not be prior to date of Contract. If Developer/Principal is Partnership, all partners should execute BOND. All BONDS signed by an agent must be accompanied by a certified copy of the authority to act.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Florida.

EXHIBIT “B”

ITB 21-13

Dated April 19, 2021

Consisting of 788 Pages

NOT ATTACHED, ON FILE WITH THE CITY CLERK

EXHIBIT “C”

Contractor’s Proposal

Consisting of 38 Pages

SECTION 7 – REQUIRED FORMS

FORM 7.1 – BID SUBMITTAL CHECKLIST

- ☒ Form 7.2 – Bidder's Acknowledgement Form
- ☒ Form 7.3 – Addendum and Change Order Procedure Acknowledgement
- ☒ Form 7.4 – Drug Free/Tie Preference Statement
- ☒ Form 7.5 – Public Entity Crimes Statement
- ☒ Form 7.6 – Affidavit of Anti-Collusion
- ☒ Form 7.7 – Statement of Bidder's Qualifications
- ☒ Form 7.8 – Professional References for Previous Experience
- ☒ Form 7.9 – Listing of Subcontractors
- ☒ Form 7.10 – Certificate as to Corporate Principal
- ☒ Form 7.11 – Local Business Affidavit of Eligibility
- ☒ Attachment 1 – Bid Proposal
- ☒ Copy of License (Florida Certified General Contractor, Sunbiz, etc.)
- ☒ Bid Bond
- ☒ Submission of one (1) original marked "ORIGINAL" and one (1) digital (CD or flash drive) version in PDF format.

BY: Saboungi Construction, Inc.

Name of Business


Authorized Signature

April 19, 2021

Date

This document must be completed and returned with your Submittal

FORM 7.2 – BIDDER'S ACKNOWLEDGEMENT FORM

I have carefully examined the Invitation to Bid (ITB), Instructions to Bidders, General and/or Special Conditions, Specifications, and any other documents accompanying or made a part of this invitation.

I hereby propose to furnish the goods or services specified in the Invitation to Bid at the prices or rates as finally negotiated. I agree that my bid will remain firm for a period of up to ninety (90) days in order to allow the City of Port Orange adequate time to evaluate the proposed bid. Furthermore, I agree to abide by all conditions of the Invitation to Bid.

I certify that all information contained in this Bid is truthful to the best of my knowledge and belief. I further certify that I am a duly authorized to submit this Bid on behalf of the Bidder/Contractor as its act and deed and that the Bidder/ Contractor is ready, willing and able to perform if awarded the contract.

I further certify that this Bid is made without prior understanding, Contract, connection, discussion, or collusion with any person, firm or corporation submitting a Bid for the same product or service; no officer, employee or agent of the City of Port Orange City Council or of any other Bidder interested in said ITB; and that the undersigned executed this Bidder's Acknowledgement with full knowledge and understanding of the matters therein contained and was duly authorized to do so.

I further certify that having read and examined the specifications and documents for the designated services and understanding the general conditions for contract under which services will be performed, does hereby propose to furnish all labor, equipment, and material to provide the services set forth in the ITB.

I hereby declare that the following listing states any clarifications, any and all variations from and exceptions to the requirements of the specifications and documents. The undersigned further declares that the "work" will be performed in strict accordance with such requirements and understands that any exceptions to the requirements of the specifications and documents may render the Bid non-responsive.

NO EXCEPTIONS ALLOWED AFTER THE BID IS SUBMITTED:

Please check one: ☒ I take NO exceptions. ☐ Exceptions (list below; add additional pages if necessary):

Saboungi Construction, Inc.

NAME OF BUSINESS

Hassan Saboungi

AUTHORIZED SIGNATURE

Hassan Saboungi Vice President

NAME, TITLE, TYPED

59 - 2219055

FEDERAL IDENTIFICATION #

290A N US Highway 1

MAILING ADDRESS

Ormond Beach, FL 32174

CITY, STATE & ZIP CODE

(386) 672-2077

TELEPHONE NUMBER / FAX NUMBER

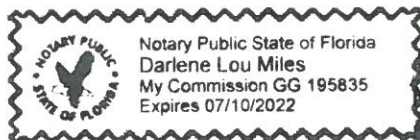
info@saboungiconstruction.com

E-MAIL ADDRESS

STATE OF Florida

COUNTY OF Volusia

The foregoing instrument was acknowledged before me by means of X physical presence or _____ online notarization, this 19th day of April, 2021, by Hassan Saboungi, as Vice President of Saboungi Construction, Inc., a _____ He or she is X personally known or _____ produced _____ as identification.



Darlene Lou Miles
Notary Public, State of Florida

Printed, typed or stamped name, commission and expiration:

This document must be completed and returned with your Submittal

FORM 7.3 – ADDENDUM and CHANGE ORDER PROCEDURE ACKNOWLEDGEMENT

ADDENDUM ACKNOWLEDGEMENT

I have carefully examined the Invitation to Bid (ITB), Instructions to Bidders, General and/or Special Conditions, Specifications, and any other documents accompanying or made a part of this invitation to Bid.

I acknowledge receipt and incorporation of the following addenda, and the cost, if any, of such revisions has been included in the price of the bid proposal.

Addendum# 1 Date: 3/30/2021 Addendum# 2 Date: 4/12/2021

Addendum# _____ Date: _____ Addendum# _____ Date: _____

CHANGE ORDER PROCEDURE ACKNOWLEDGEMENT

If awarded the Contract for this Solicitation, I acknowledge that no oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders requests shall be made in writing by the Contractor for review by the Contract Administrator for the City of Port Orange. No work shall be performed as set forth in the change order until the Contractor receives an executed Purchase Order for the requested change.

I acknowledge the following statement regarding Change Orders to the awarded Contract:

Saboungi Construction, Inc.

Name of Business

By: Hassan Saboungi

Printed Name: Hassan Saboungi

Title: Vice President

STATE OF Florida

COUNTY OF Volusia

The foregoing instrument was acknowledged before me by means of X physical presence or _____ online notarization, this 19th day of April, 2021, by Hassan Saboungi who is personally known to me or who produced _____ as identification.

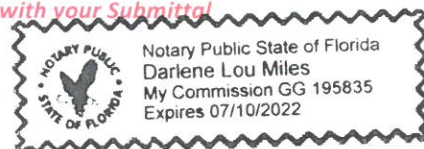
My Commission Expires: GG 195835

Darlene Lou Miles

Notary Public, State of Florida

Printed, typed or stamped name, commission and expiration:

This document must be completed and returned with your Submittal



FORM 7.4 – DRUG-FREE PREFERENCE STATEMENT

IDENTICAL TIE BIDS - Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids, proposals, statements, or replies that are equal with respect to price, quality, and service are received by the city for the procurement of commodities or contractual services, a bid received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied bidders have a drug-free workplace program.

In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of Section 287.087, Florida Statutes.

As an authorized representative of the firm, I certify that this firm complies fully with the above requirements.

Saboungi Construction, Inc.

Name of Business

By: Hassan Saboungi

Printed Name: Hassan Saboungi

Title: Vice President

STATE OF Florida

COUNTY OF Volusia

The foregoing instrument was acknowledged before me by means of X physical presence or
online notarization, this 19th day of April, 20 21, by Hassan Saboungi who
is personally known to me or who produced _____ as identification.

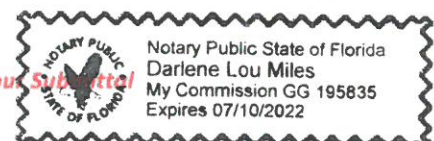
My Commission Expires: 07/10/2022

Darlene Lou Miles

Notary Public, State of Florida

Printed, typed or stamped name, commission and
expiration:

This document must be completed and returned with your Submittal



FORM 7.5 – SWORN STATEMENT UNDER SECTION 287.133(3)(A), FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

(To be signed in the presence of notary public or other officer authorized to administer oaths.)

Before me, the undersigned Authority, personally appeared affiant Hassan Saboungi, who, being by me first duly sworn, made the following statement:

1. The business address of Saboungi Construction, Inc. (name of Offeror or business) is 290A N US Highway 1, Ormond Beach, FL 32174.
2. My relationship to Saboungi Construction, Inc. (name of Offeror or business) is President (relationship such as sole proprietor, partner, president, vice president).
3. I understand that a public entity crime as defined in Section 287.133 of the Florida Statutes includes a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity in Florida or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any proposal or contract for goods or services to be provided to any public entity or such an agency or political subdivision and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.
4. I understand that "convicted" or "conviction" is defined by the Florida Statutes to mean a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilt or nolo contendere.
5. I understand that "affiliate" is defined by the Florida Statutes to mean (1) a predecessor or successor of a person or a corporation convicted of a public entity crime, or (2) an entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime, or (3) those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate, or (4) a person or corporation who knowingly entered into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months.
6. Neither the Offeror or contractor, nor any officer, director, executive, partner, shareholder, employee, member or agent who is active in the management of the Offeror or contractor, nor any affiliate of the Offeror or contractor has been convicted of a public entity crime subsequent to July 1, 1989. (Draw a line through paragraph 6 if paragraph 7 below applies.)
7. There has been a conviction of a public entity crime by the Offeror or contractor, or an officer, director, executive, partner, shareholder, employee, member or agent of the Offeror or contractor who is active in the management of the Offeror or contractor or an affiliate of the Offeror or contractor. A determination has been made pursuant to Section 287.133(3) by order of the Division of Administrative Hearings that it is not in the public interest for the name of the convicted person or affiliate to appear on the convicted bidder list. The name of the convicted person or affiliate is: _____
A copy of the order of the Division of Administrative Hearings is attached to this statement. (Draw a line through paragraph 7 if paragraph 6 above applies.)

Saboungi Construction, Inc.

Name of Business

By: Hassan Saboungi

Printed Name: Hassan Saboungi

Title: Vice President

STATE OF Florida
COUNTY OF Volusia

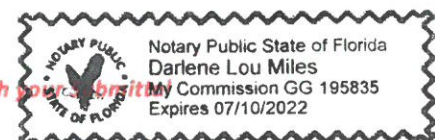
The foregoing instrument was acknowledged before me by means of X physical presence or
online notarization, this 19th day of April, 20 21 by Hassan Saboungi who
is personally known to me or who produced _____ as identification.

My Commission Expires: 07/10/2022

Darlene Lou Miles

Notary Public, State of Florida

Printed, typed or stamped name, commission and
expiration:



This document must be completed and returned with your originality.

ANTI-COLLUSION STATEMENT BID FORM:

FORM 7.7 – STATEMENT OF BIDDER'S QUALIFICATIONS

The undersigned warrants that he or she is duly authorized to complete this document, and hereby affirms that the information contained in Form 7.8 is complete, true, and correct to the best of their knowledge and belief. If necessary, questions may be answered on separate paper and attached, with any additional information that may be pertinent.

- A. Name of Bidder.
- B. Permanent main office address.
- C. Date organized.
- D. If a corporation, where incorporated.
- E. How many years have you been engaged in the contracting business under your present firm or trade name?
- F. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion.)
- G. General character of work performed by your company.
- H. Have you ever failed to complete any work awarded to you? If so, where and why?
- I. Have you ever defaulted on a contract? If so, where and why?
- J. List the more important projects recently completed by your company, stating the approximate cost for each and the month and year completed.
- K. List your major equipment currently owned or leased.
- L. Experience in work similar to this type of project.
- M. Background and experience of the principal members of your organization, including the officers.
- N. Credit currently available: \$ _____
- O. Give bank reference: _____
- P. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the Owner?
- Q. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of Bidder's Qualifications.

Saboungi Construction, Inc.

Name of Business

By: Hassan Saboungi

Printed Name: Hassan Saboungi

Title: Vice President

STATE OF Florida

COUNTY OF Volusia

The foregoing instrument was acknowledged before me by means of X physical presence or
_____ online notarization, this 19th day of April, 20 21 by Hassan Saboungi who
is personally known to me or who produced _____ as identification.

My Commission Expires: 07/10/2022

Darlene Lou Miles
Notary Public, State of Florida
Printed, typed or stamped name, commission number
expiration: My Commission CG 195835
Expires 07/10/2022

This document must be completed and returned with your Submittal

M. "Mike" Saboungi
President



Hassan Saboungi
Vice President

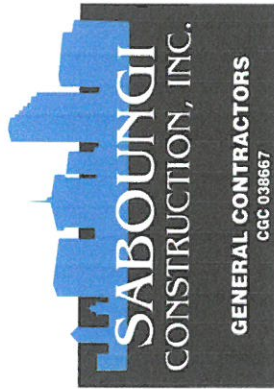
290 A North U.S. Highway 1, Ormond Beach, FL 32174-4504
Tel: (386) 672-2077 Fax: (386) 673-4189
www.saboungiconstruction.com

FORM 7.7 – STATEMENT OF BIDDER'S QUALIFICATIONS

- A. Saboungi Construction, Inc.
- B. Permanent address is 290A North U.S. Hwy 1, Ormond Beach, FL 32174
- C. Organized in June 1982
- D. Incorporated in the State of Florida
- E. Engaged in the contracting business for 39 years
- F. Please see the attached list of Contracts on Hand
- G. We perform all commercial construction consisting of renovations, additions, new construction, site work, etc., for both the public and private sectors
- H. Saboungi Construction has never failed to complete any work awarded
- I. Saboungi Construction has never defaulted on a contract
- J. Please see the attached list of Completed Projects
- K. We own a water tanker, a dump trailer, generators, compressors, lasers and hand tools. We lease larger equipment as needed from Synergy, United, etc.
- L. Please see the attached list of Completed Projects. Our company completed the Original Expansion and Renovation to the Port Orange Recreation Building in 1989.
- M. Please see the attached Resumes of Hassan Saboungi and Mike Saboungi
- N. Credit available is \$100,000
- O. Suntrust Bank
- P. Saboungi Construction is willing to provide a detailed financial statement and furnish other information, upon request.

290 North U.S. Highway 1, Suite A
Ormond Beach, FL 32174-4504

Tel (386) 672-2077
Fax (386) 673-4189



M. "Mike" Saboungi
President

Hassan Saboungi
Vice President

CONSTRUCTION PROJECTS IN PROGRESS

Name of Project	Amount	Estimated Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
Fire Station #32 Parking Lot	\$29,952	4/21	Zev Cohen & Assoc. Inc. 300 Interchange Blvd., Suite C Ormond Beach FL 32174 Randy Hudak 386-677-2482	County of Volusia 123 W Indiana Ave DeLand FL 32720 386-736-5967	
Ponce Preserve Boardwalk Repair Ponce Inlet, FL	\$40,000	4/21	N/A	Town of Ponce Inlet 4300 S Atlantic Ave Ponce Inlet, FL 32127 Jeff Miller, Public Works Director 386-236-2150	
Lemon Bluff Marine Park 949 Lemon Bluff Rd. Osteen, FL 32764	\$1,811,258	4/21	DMC Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 386-304-6505 www.dmcscs.com	County of Volusia 123 W Indiana Ave DeLand FL 32720 386-804-7403 Charles Conway cconway@volusia.org	

Name of Project	Amount	Estimated		Design Architect or Engineer	Owner	References
		Completion Date	Address & Phone			
Sperling Sports Complex Field Improvements & Restroom/Concession Building	\$674,265	4/21	CPH Engineers Inc 500 W Fulton St. Sanford, FL 32771 407-322-6841 Jason Kellogg, P.E.	City of Deland 120 S Florida Ave. DeLand FL 32121-0449 386-626-7197 Mr. Keith Riger, P.E.	Mr. Keith Riger, P.E. Public Services Director	
Dune Crossover Daytona Beach Shores	\$36,500	5/21	N/A	Mr. John Volchko 1099 Walnut Woods Place Lake Mary, FL 32746		
Plaza Blvd. Phase I	\$566,648	5/21	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 Ankeet Rama 386-304-6505	County of Volusia 123 W Indiana Ave DeLand FL 32724 Mr. Niles Cyzycki 386-248-8072 X20357		
Plaza Blvd. Phase II	\$228,178		Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 Ankeet Rama 386-304-6505	County of Volusia 123 W Indiana Ave DeLand FL 32724 Mr. Niles Cyzycki 386-248-8072 X20357		
18 th Ave Pedestrian Beach Access Structure	\$253,160	6/21	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 Ankeet Rama 386-304-6505	County of Volusia 515 S Atlantic Ave Daytona Beach FL 32118 Mr. Niles Cyzycki 386-248-8072 X20357 ncyzycki@volusia.org		
Halifax Health Pediatrics Renovation	\$1,128,810	8/21	Studio W Architecture 1147 Bittsdale Ct Apopka FL 32712 Valerie Ward	Halifax Health Medical Center 303 N Clyde Morris Blvd. Daytona Beach FL 32114 John Lavin 386-425-4000		

Name of Project	Amount	Estimated		Design Architect or Engineer	Owner	References
		Completion Date	Address & Phone			
ICDB Derbyshire Buiding 825 Derbyshire Rd Daytona Beach, FL 32117	\$1,988,400	10/21	BFY Associates Inc. 645 N. Halifax Ave. Daytona Beach FL 32118 386-405-3152 Roman Yurkiewicz, Arch., Pres. BFY@aol.com	Islamic Center of Daytona Beach Inc 347 S Keech St Daytona Beach FL 32114 386-401-9353 Mr. Khalid Resheidat Nhffmkr@gmail.com		

290 North U.S. Highway 1, Suite A
Ormond Beach, FL 32174-4504

Tel (386) 672-2077
Fax (386) 673-4189



M. "Mike" Saboungi
President

Hassan Saboungi
Vice President

SOME CONTRACTS COMPLETED IN THE PAST SEVERAL YEARS BY OUR FIRM...

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
One Caring Family ALF 3130 Opportunity Court South Daytona FL 32119	\$1,814,139	07/20	BFY Associates Inc. Roman Yurkiewicz, Arch., Pres. 645 N. Halifax Ave. Daytona Beach FL 32118 386-405-3152 BFY@aol.com	Regina Ashihene, M.D., LLC Regina Ashihene 5856 Boggsford Rd. Port Orange FL 32127 386-451-6871 riasihene@gmail.com	
Bay Drive Park Bay Drive off A1A Palm Coast, Flagler Co., FL	\$723,250	4/20	DJ Design Services, Inc. 913 North Nova Road Holly Hill, FL 32117 (386) 255-6987 Mr. Jim Wachtel	Flagler County 1769 E Moody Blvd., Bldg. 2 Bunnell FL 32110 386-313-4001 Amy Kennedy Stroger	
Pollard Park Improvements 4680 S Peninsula Dr Ponce Inlet FL 32127	\$820,262	04/20	Mead & Hunt 4401 Eastport Parkway Port Orange FL 32127 386-761-6810 Andrew Giannini, PE portorangebids@meadhunt.com	Town of Ponce Inlet 4300 S Atlantic Ave Ponce Inlet FL 32127 386-236-2180 Ms. Peg Hunt phunt@ponce-inlet.org	

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
Holland Park Phase II Palm Coast, FL Masonry	\$21,200	3/20	Joseph Pozzuoli, Architect 314 Moody Blvd. Flagler Beach FL 32136 386-439-5650 Mr. Joseph Pozzuoli	BBI Const. Mgmt Inc 4639 NW 53 rd Ave. Gainesville FL 32653 352-338-2073 Mr. Luke Burge	
Halifax Harbor Marina Seawall Restoration 450 Basin St. Daytona Beach, FL 32114	\$334,757	01/20	DRMP 941 Lake Baldwin Lane Orlando FL 32814 407-896-0594	City of Daytona Beach PO Box 2451 Daytona Beach 32115-2451 386-671-8613 Jim Nelson	
Ocean Center Parking Garage Elevator Vestibule Replacement	\$55,400	12/19	DJ Design Inc 913 N Nova Rd. Holly Hill, FL 386-255-6987 Mr. Jim Wachtel	County of Volusia 123 W Indiana Ave DeLand FL 32724 386-736-5920 Shaira D Resto, MBA, CPPB sresto@volusia.org	
Off Beach Parking 650 S Atlantic Ave. Ormond Beach, FL Lifeguard Maintenance Facility & Public Parking	\$1,950,708	10/19	DJ Design Inc 913 N Nova Rd. Holly Hill, FL Mr. Jim Wachtel 386-255-6987	County of Volusia 123 W Indiana Ave DeLand FL 32724 Mr. Niles Cyzycki 386-736-5920	
Hemaidan Williamson Building 4015 S Williamson Blvd. Port Orange FL 32129	\$60,000	09/19	BFY Associates Inc. 645 N. Halifax Ave. Daytona Beach FL 32118 386-405-3152 Roman Yurkiewicz, Arch., Pres BFY@aol.com	Rainbow Development Gp LLC 1690 Dunlawton Ave, Ste. 510 Port Orange FL 32127-8980 Dr. Amar Hemaidan	
27 th Ave Beachfront Park Site & Drainage Improvements 3701 S A1A New Smyrna Beach FL 32168	\$160,400	07/19	Parker Mynchenberg & Assoc Inc 1729 Ridgewood Ave Holly Hill FL 32117 386-677-6891	City of New Smyrna Beach 210 Sams Ave New Smyrna Beach FL 32168 386-424-2209 Kyle Fegley P.E. Kfegley@cityofnsb.com	

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
Bethune Point Park Observation Pier Repair	\$94,842	05/19	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 386-304-6505 Mr. Stephen J Kuhn	City of Daytona Beach PO Box 2451 Daytona Beach FL 32115-2451 386-671-8613 Mr. Jim Nelson	
Swoope Boat Ramp Phase 2 Improvements New Smyrna Beach, FL	\$635,611	4/19	Quentin L Hampton Assoc. 4401 Eastport Parkway Port Orange FL 32127 Andrew Giannini, P.E. 386-414-5052 andrew.giannini@meadhunt.com	City of New Smyrna Beach 210 Sams Ave. New Smyrna Beach FL 32168 Kyle Fegley, P.E. 386-424-2209 Kfegley@cityofnsb.com	
Hope Place Library Services Facility Part B Const. Mgmt GMP Daytona Beach, FL	\$900,000	4/19	Hall & Ogle, Arch. 208 Magnolia Ave. Daytona Beach FL 32114 Mr. David Ogle 386-255-6163 dogle@hoarchitects.com	County of Volusia 123 W Indiana Ave DeLand, FL 32720 Mr. Gary Morton 386-626-6623 GMorton@volusia.org	
Modad Patricia Medical Office Palm Coast, FL	\$98,864.00	4/19	BFY Associates Inc. Roman Yurkiewicz, Arch., Pres 645 N. Halifax Ave. Daytona Beach FL 32118 386-405-3152 BFY@aol.com	Patricia Modad, M.D. Palm Coast OBGYN Inc 50 Leanni Way, Suites A3, A4 Palm Coast FL 32137	
Riverside Park Gazebo Replacement New Smyrna Beach, FL	\$31,247	11/18	City of New Smyrna Beach 210 Sams Ave New Smyrna Beach FL 32168 Michelle Vallance 386-410-2613 mvallance@cityofnsb.com	City of New Smyrna Beach 210 Sams Ave. New Smyrna Beach FL 32168 Michelle Vallance 386-410-2613 mvallance@cityofnsb.com	
Public Safety Docking Facility At Vilano Boat Ramp St. Augustine, FL	\$508,400	10/18	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129	St. Johns County 500 San Sebastian View St. Augustine FL 32084	Mr. Shailesh Patel, P.E. 386-304-6505 spatel@dmces.com

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
			Mr. Shailesh Patel 386-304-6505 spatel@dmcees.com	Jaime Locklear, Asst P.M. 904-209-0158	
Hammock Dunes Walkovers	\$739,200	06/18	Stephenson, Wilcox & Assoc. Inc. 204 N Railroad St. Bunnell, FL 32110 Mr. Dan A Wilcox, P.E. 386-407-2363	Hammock Dunes Owners Assn Inc PO Box 353338 Palm Coast FL 32135 Mr. Travis Houck 863-698-2190	
Dune Walkover Restoration Daytona Beach Shores	\$348,010	05/18	Hall & Ogle, Arch. 208 Magnolia Ave. Daytona Beach FL 32114 Mr. David Ogle 386-255-6163 dogle@hoarchitects.com	City of Daytona Beach Shores 2990 S Atlantic Ave. Daytona Beach Shores FL 32118 Mr. Fred Hiatt 386-763-5353	
Dune Walkover Reconstruction Group 1	200,960	04/18	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 Mr. Shailesh Patel 386-304-6505 spatel@dmcees.com	County of Volusia 123 W Indiana Ave DeLand, FL 32720 Mr. Gary Morton 386-626-6623 GMorton@volusia.org	
Public Works Restoration South Daytona, FL	39,680	02/18	City of South Daytona	City of South Daytona PO Box 214960 South Daytona FL 32121-4960 Mr. Les Gillis, P.E. Deputy City Manager Public Works Director 386-322-3080 lgillis@southdaytona.org	
Restrooms at pcnaf & itisc	930,200	12/17	Marquis Latimer + Halback, Inc. 34 Cordova Street, Suite A St. Augustine FL 32084 PM: Jeremy Marquis 386-986-3780 904-825-6747	City of Palm Coast 160 Lake Ave. Palm Coast, FL 32164 Mr. Carl Cote 386-986-3780 386-986-3748	

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
YMCA Design Build ADA Bathroom Addition	124,800	12/17	BFY Associates Inc. Roman Yurkiewicz, Arch., Pres. 645 N. Halifax Ave. Daytona Beach FL 32118 © 386-405-3152	City of Edgewater Robin Matusick, City Clerk PO Box 100 Edgewater, FL 32132-0100 386-424-2400 X 1101	
Riverwalk Park Phase 1B 3441 Ridgewood Ave. Port Orange FL 32129 Large Public Park with Splash Pad & Amenities	3,605,400	10/17	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 Mr. Stephen Kuhn, P.E. 386-304-6505 SKuhn@dmces.com	City of Port Orange 1000 City Center Circle Port Orange, FL 32129 Ms. Susan Lovallo 386-506-5852 slovullo@port-orange.org	
New Pavilion at Mary Ave. Tot Lot	23,300	8/17	N/A	City of New Smyrna Beach 210 Saws Ave. New Smyrna Beach FL 32168 Ms. Donna Park 386-314-4849 dbanks@CityOfNSB.com	
Lotus Inn Elevator Bldg.	44,950	7/17	MS Structural Engineers John Simco 386-672-1214	Lotus Inn Motel 505 S. Atlantic Ave. Ormond Beach FL 32176 Mr. Kinit Patel 386-214-0434	
Off-Beach Parking at 880 N Atlantic Ave. Daytona Beach, FL	734,635	7/17	Hall & Ogle Arch. Inc. 208 Magnolia Ave. Daytona Beach FL 32114 Mr. David Ogle 386-255-6163 dogle@hoarchitects.com Parker Mychenberg & Assoc. 386-677-6891	County of Volusia 123 W Indiana Ave. DeLand, FL 32720 Inga Fegley, CPPB 386-626-6623 ifegley@volusia.org Gary Morton GMorton@volusia.org	
Spring Gardens Heights ADA Sidewalk DeLand, FL	76,600	1/17	Volusia County VC Road & Bridge 2560 SR 44 DeLand, FL	County of Volusia 123 W Indiana Ave DeLand, FL 32720 Tom Morrissey	

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
			Tom Morrissey 386-822-6422 tmorrissey@volusia.org	386-626-6623	
Daytona Helmets 1810 Mason Ave. Daytona Beach, FL 32117 Office, Warehouse & Distribution, 25,720 sf	2,159,483	12/16	BFY Associates Inc. 203 Glenview Blvd. Daytona Beach, FL 32118 Mr. Roman Yurkiewicz, R.A. 386-258-2261	The L Squared, LLLP 4929 N Waterbridge Circle Port Orange, FL 32129 Mr. Joey Linge 386-871-8061	
Holsonback Sidewalk Project	103,408	12/16	City of Daytona Beach 301 S Ridgewood, Rm 146 Daytona Beach FL 32114 Michelle Martin, P.M. Public Works Division martinm@codb.us	City of Daytona Beach 301 S Ridgewood, Rm 146 Daytona Beach FL 32114 Michelle Martin, P.M. Public Works Division martinm@codb.us	
Restoration of the Historic Daytona Beach Bandshell	460,088	10/16	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	
Midtown Auxiliary Building 925 George Ingram Blvd.	124,020	10/16	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	
Votran Super Stop Julia St. New Smyrna Beach, FL	319,273	10/16	Parker Mynchenberg & Associates Inc 1729 Ridgewood Ave. Holly Hill FL 32117	County of Volusia 123 W Indiana Ave., Room 302 DeLand FL 32720-4608 Mr. Gary Morton, Const. Mgr. gmorton@volusia.org	
Restoration of the Historic Daytona Beach Clock Tower	236,016	6/16	City of Daytona Beach 950 Bellevue Ave	City of Daytona Beach 950 Bellevue Ave.	

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
50 Boardwalk			Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	
Utilities Storage Building West Volusia Transfer Station DeLand, FL	416,710	06/16	Neel-Schaffer, Inc. 2301 Lucien Way, Ste. 300 Maitland FL 32751 Mr. Ron S Beladi, PM ron.beladi@neel-schaffer.com	County of Volusia 123 W Indiana Ave., Room 302 DeLand FL 32720-4608 Mr. Scott Mays, P.E., P.M. smays@volusia.org	
Halifax River Greenway Trail 101 N Beach St. Daytona Beach FL 32117	316,845	05/16	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Jim Nelson, P.E. City Engineer 386-671-8613 NelsonJ@CODB.US	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Jim Nelson, P.E. City Engineer 386-671-8613 NelsonJ@CODB.US	

HASSAN SABOUNGI



Vice President / Treasurer
Senior Project Manager / Senior Estimator
Certified General Contractor 1986
State of Florida License Number CGC 038667
Certified Renovator in 2010
U.S. Environmental Protection Agency
Bachelor of Science Business Administration 1982
University of Central Florida

Phone 386-672-2077

Fax 386-673-4189

Email Hassan@saboungiconstruction.com

Cell 386-547-4714

Hassan Saboungi has experience in the construction industry since 1982, all of which have been with **Saboungi Construction Inc.** since he co-founded it. Hassan Saboungi has had a major role in the project management and administration of 180+ contracts. He has been a senior construction manager for over 100 private and public contracts. He has performed the services of senior estimator, contract negotiation, pre-construction & value engineering, project management in addition to design-build construction contracts. His additional duties include risk management and financial oversight of **Saboungi Construction, Inc.** plus other business interests.

Schools

New Cunningham Creek Elementary School for St Johns County, Additions & Renovations projects at Ormond Beach Middle, Osceola Elementary, DeLand High, Chisholm Elementary, Campbell Middle, Holly Hill Middle, Southwestern Middle and Over 20+ projects for the Volusia County School Board.

Public Safety

Deland Fire Station West, Ormond Beach Fire Station 93, Ormond Beach Fire Station 91 Renovations

Commercial

Nova Fountain Business Park, Twin Fountains Business Center, Longwood Self Storage, All Aboard Storage, Bravo Supermarket, Daytona Helmets.

RESUME

Health and Medical Services

Majestic Springs Assisted Living Facility, Gentle Dental, Eagle Eye Dental, Advanced Healthcare Center, Advanced Gastroenterology, Volusia OB/GYN, Volusia Internal Medicine Specialists, Atlantic Veterinary Hospital, Tomoka Medical Lab, LabCorp, Children's Medical Center.

Site Utility and Infrastructure

Woodland Boulevard Main Street Deland Streetscape, Granada Boulevard Ormond Beach Streetscape, New Smyrna Beach Industrial Park, Sidewalks and Public safety projects thru out Volusia County

Parks and Recreation

Port Orange Riverwalk Park, Ormond Beach Andy Romana Beachfront Park. Boardwalk Park & Bandshell Improvements, *Port Orange Gymnasium Addition and Renovation*, *Port Orange Amphitheater Roof*, *Port Orange YMCA Additions and Renovations*, *Spruce Creek Park Improvements*, Bethune Point Park, Ormond Beach Gymnastics Building.

Historical Renovations

Daytona Beach Historic Bandshell Exterior Restoration, Clocktower Historic Restoration, MacDonald House, Ames House, Fire Station No. 91.

Multi-Family

River Oaks Condominium, Multiple U. S. Housing and Urban Development Modernization projects.

Worship

Islamic Center of Daytona Beach, Muslim Cemetery of Volusia County.

This is only a partial list of the numerous projects Hassan Saboungi completed with **Saboungi Construction, Inc.**



M. "MIKE" SABOUNGI

President
Senior Project Manager / Senior Estimator
Certified General Contractor 1979
State of Florida License Number CGC 013521
Bachelor of Science in Applied Science 1952
Universite De Lyon in Beirut, Lebanon
Masters in Civil Engineering 1954
Universite De Lyon in Beirut, Lebanon

Phone 386-672-2077

Fax 386-673-4189

Email Mike@saboungiconstruction.com

Cell 386-547-4715

Mike Saboungi practiced civil engineering from 1954 to 1962. In 1962, he began a contracting business building airports, municipal buildings and highrise condominiums. In 1977, he moved to Florida where upon he acquired his Florida GC license. After working as a sole proprietor, he co-founded **Saboungi Construction, Inc.** in 1982. His vast experience in engineering and construction from 1954 to the present allows him to excel at all challenges. Mike Saboungi has had a major role in the project management and administration of 180+ contracts. He has performed the duties of senior estimator, contract negotiation, pre-construction & value engineering and project management.

Schools

Various Additions & Renovations projects at Seabreeze High, T.D. Taylor High, New Smyrna Beach High, Starke Elementary, Osceola Elementary, Pine Trail Elementary, Ormond Beach Elementary, Spruce Creek Elementary and over 20+ projects for the Volusia County School Board.

Public Safety

Flagler Beach Police Station, Volusia County Sheriff Communication Center, Volusia County Sheriff Shooting Range.

Post Offices

Ormond Post Main Office, Palm Coast Main Post Office, Port Orange Post Office fuel station Addition.

RESUME

Parks and Recreation

Marine Science Center Phase I and Phase II, Indian Lakes Sports Complex, Belle Terre Park, Ralph Carter Park, Seminole Woods Park, Matanzas & Marineland Park, Indian River lagoon Park, South Ormond Recreation Center just to name a few.

Site Utility and Infrastructure

Ormond Beach water treatment plant renovations and miles of sidewalk projects for most of the local municipalities.

Health and Medical Services

Flagler County Health Department Center, Turtle Creek Medical Center, LeCompte Orthodontics, Dr. Souheil Moussly Medical Office.

Commercial

Anything Goes Gift Shop, Nationwide Insurance, Speedway Gas Stations, Discount Auto Parts.

Historical Renovations

Tarragona Arch Renovations, Dr. Josie Rogers House, Excelsior Service Center HRS Headquarters for St. Johns County.

Worship

Islamic Center of Daytona Beach, Muslim Cemetery of Volusia County.

This is only a partial list of the numerous projects Mike Saboungi completed with **Saboungi Construction, Inc.**

FORM 7.8 – PROFESSIONAL REFERENCES FOR PREVIOUS EXPERIENCE

The Bidder proposes that they are qualified to perform the referenced work and has successfully done so on recent projects similar in nature and size. The City reserves the right to check references and confirm information provided herein.

Please provide three (3) current and correct references from clients for similar services.

(Do not include the City of Port Orange)

1. Company Name: County of Volusia
Contact Person: Niles Cyzycki
City, State: 650 S. Atlantic Ave., Ormond Beach, FL
Telephone Number: (386) 248-8072 x20357
Email Address: ncyzycki@volusia.org
Description of goods or
Services provided: Off Beach
Contract Amount: \$ 1,950,708
Start/End Date of Contract: Completed October 2019
2. Company Name: City of New Smyrna Beach
Contact Person: Michelle Vallance
City, State: 201 N. Myrtle Ave., New Smyrna Beach
Telephone Number: 386-410-2613 or 386-402-6109
Email Address: mvallance@cityofnsb.com
Description of goods or
Services provided: Babe James Splash Park
Contract Amount: \$ 520,986.
Start/End Date of Contract: Completed October 2020
3. Company Name: Town Manager Town of Ponce Inlet
Contact Person: Mrs. Jeaneen Witt
City, State: 4300 S. Atlantic Ave., Ponce Inlet, Florida 32127
Telephone Number: 386-236-2150
Email Address: jwitt@ponce-inlet.org
Description of goods or
Services provided: Pollard Park Improvements
Contract Amount: \$ 820,262
Start/End Date of Contract: Completed April 2020

This document must be completed and returned with your Submittal.

FORM 7.8 – PROFESSIONAL REFERENCES FOR PREVIOUS EXPERIENCE

The Bidder proposes that they are qualified to perform the referenced work and has successfully done so on recent projects similar in nature and size. The City reserves the right to check references and confirm information provided herein.

Please provide three (3) current and correct references from clients for similar services.

(Do not include the City of Port Orange)

1. Company Name: Majestic Gardens Assisted Living Facility
Contact Person: Regina Asihene
City, State: 3130 Opportunity Court, South Daytona, FL
Telephone Number: 386-562-6871
Email Address: rjasihene@gmail.com
Description of goods or
Services provided: Majestic Gardens Assisted Living Facility
Contract Amount: \$1,814,814
Start/End Date of Contract: Completed May, 2020
2. Company Name: The L Squaired LLLP
Contact Person: Joey Linge
City, State: 1810 Mason Road, Daytona Beach, FL 32117
Telephone Number: 386-871-8061
Email Address: joey@daytonahelmets.com
Description of goods or
Services provided: Daytona Helmets Corporate Facility
Contract Amount: 2,359,483
Start/End Date of Contract: Completed December, 2016
3. Company Name: Rainbow Development Group LLC
Contact Person: Ammar Hemaidan
City, State: Port Orange, Florida
Telephone Number: 386-795-4324
Email Address: AHemaidan@gmail.com
Description of goods or
Services provided: Madeline & Williamson Property Improvements
Contract Amount: 636,892
Start/End Date of Contract: Completed June, 2020

This document must be completed and returned with your Submittal.

LISTING OF PREVIOUS EXPERIENCE

Commercial Client List

The Bidder proposes that they are qualified to perform the referenced work and has successfully done so on recent projects similar in nature and size. A minimum of three (3) projects must be listed below. The Owner reserves the right to check references and confirm information provided herein.

List clients to whom you currently provide or have in the past provided equal or similar to those required under the City's contract and as outlined in this bid package. A minimum of three (3) projects shall be listed below in order to bid on this contract. The Owner reserves the right to check references and confirm information provided herein.

	Contact Name	Phone	Current Client? Y or N	Number of years service provided	Description of service
1	See Attached List Under 7.7				
2					
3					

This document must be completed and returned with your Submittal.

FORM 7.9 – LISTING OF SUBCONTRACTORS

The Bidder proposes that the following subcontractors are qualified to perform the referenced work and have successfully done so on recent projects similar in nature and size. All subcontractors as referenced in Specifications Section 013300-2.1, I (1) shall be listed. Upon approval of subcontractors listed, the successful **Bidder shall not substitute subcontractors without approval from the City.** Bidder shall attach additional sheets as necessary.

Subcontractor No. 1

Name: Local Electric Services, LLC

Description of Work: Electrical / F.A. / Lightning Protection

Percent of Contract Price: 11.5 %

Previous Experience Together: Yes/No No

Subcontractor No. 2

Name: Advance Mechanical Systems, Inc.

Description of Work: HVAC

Percent of Contract Price: 5.8%

Previous Experience Together: Yes/No No

Subcontractor No. 3

Name: G&W Welborn Plumbing, LLC

Description of Work: Plumbing

Percent of Contract Price: 5.2%

Previous Experience Together: Yes/No Yes

Subcontractor No. 4

Name: AWS Roofing

Description of Work: Roofing

Percent of Contract Price: 6.4%

Previous Experience Together: Yes/No Yes

Subcontractor No. 5

Name: Colson Corp

Description of Work: Acoustical Ceiling

Percent of Contract Price: 1%

Previous Experience Together: Yes/No Yes

This document must be completed and returned with your Submittal

FORM 7.9 – LISTING OF SUBCONTRACTORS

The Bidder proposes that the following subcontractors are qualified to perform the referenced work and have successfully done so on recent projects similar in nature and size. All subcontractors as referenced in Specifications Section 013300-2.1, I (1) shall be listed. Upon approval of subcontractors listed, the successful **Bidder shall not substitute subcontractors without approval from the City.** Bidder shall attach additional sheets as necessary.

Subcontractor No. 1

Name: Hogan Glass Corp

Description of Work: Aluminum Storefronts

Percent of Contract Price: 2.6%

Previous Experience Together: Yes/No Yes

Subcontractor No. 2

Name: Ocean Flooring Co.

Description of Work: Flooring & Tile

Percent of Contract Price: 1.5%

Previous Experience Together: Yes/No Yes

Subcontractor No. 3

Name: Marcos' Custom Cabinetry

Description of Work: Millwork

Percent of Contract Price: .7%

Previous Experience Together: Yes/No No

Subcontractor No. 4

Name: Big Value Garden Center

Description of Work: Landscape / Irrigation

Percent of Contract Price: .7%

Previous Experience Together: Yes/No Yes

Subcontractor No. 5

Name: GMS Green Mountain Specialties

Description of Work: Structural Steel

Percent of Contract Price: 11.2%

Previous Experience Together: Yes/No Yes

This document must be completed and returned with your Submittal

FORM 7.9 – LISTING OF SUBCONTRACTORS

The Bidder proposes that the following subcontractors are qualified to perform the referenced work and have successfully done so on recent projects similar in nature and size. All subcontractors as referenced in Specifications Section 013300-2.1, I (1) shall be listed. Upon approval of subcontractors listed, the successful **Bidder shall not substitute subcontractors without approval from the City**. Bidder shall attach additional sheets as necessary.

Subcontractor No. 1

Name: Samsula Demolition

Description of Work: Selective Demolition

Percent of Contract Price: .8%

Previous Experience Together: Yes/No Yes

Subcontractor No. 2

Name: Saboungi Construction, Inc.

Description of Work: Metal Stud Framing & Drywall / Painting/ Concrete Placement / Rough Carpentry

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

Subcontractor No. 3

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

Subcontractor No. 4

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

Subcontractor No. 5

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

This document must be completed and returned with your Submittal

FORM 7.10 – CERTIFICATE AS TO CORPORATE PRINCIPAL

I, Maisha Saboungi, certify that I am the Saboungi Construction, Inc. secretary of the corporation named as Principal in the within Bid Bond; that Hassan Saboungi Vice President, who signed the said Bid Bond on behalf of the Principal, was then of said corporation; that I know his signature, and his signature thereto is genuine; and that said Bid Bond was duly signed, sealed and attested for in behalf of said corporation by authority of its governing body.


Signature

AFFIX CORPORATE SEAL

This document must be completed and returned with your Submittal

FORM 7.11 - LOCAL BUSINESS AFFIDAVIT OF ELIGIBILITY

City of Port Orange

*This declaration is executed under penalty of perjury of the laws to the United States and State of Florida***THIS AFFIDAVIT IS SUBMITTED IN REFERENCE TO THE FOLLOWING SOLICITATION:**RFSQ/RFP/ITN/BID/CONTRACT/PROJECT #(as applicable): ITB #21-13BUSINESS NAME: Saboungi Construction, Inc. CONTACT PERSON/TITLE: Vice President MAILING ADDRESS: 290A N US Highway 1,CITY-STATE-ZIP: Ormond Beach, FL 32174 Length of Time at Address Provided: 39 YearsPhysical Presence of Business: ☒ Headquarters, ☐ Manufacturing Facility, or ☐ Locally Owned FranchiseAnd within Legal Boundaries: ☐ The City of Port Orange ☒ Volusia County ☐ The State of

Florida FEIN (Federal Employer Identification Number): _____

BUSINESS STRUCTURE: ☒ Corporation ☐ LLC ☐ Partnership ☐ Sole Proprietorship
☐ Other (Specify): _____PHONE NUMBER: (386) 672-2077 FAX: (386) 673-4189EMAIL: info@saboungiconstruction.com****Please attach a valid business tax receipt, or other such documentation******ATTESTATION – I understand that:**

- In accordance with City Of Port Orange City Code 2-275, local businesses shall have five (5) business days from bid/proposal opening to submit a best and final bid for evaluation. To qualify: A Port Orange business initial bid must be within (8%) of the lowest and best responsible bid from a non-Port Orange business; A Volusia County business initial bid must be within (5%) of the lowest and best responsible bid from a non-Volusia County business; A State of Florida business initial bid must be within (3%) of the lowest and best responsible bid from a non-State of Florida business.
- A local business must have its headquarters, manufacturing facility, or locally owned franchise located within the legal boundaries of the City of Port Orange, Volusia County, or the State of Florida, as indicated herein, for at least twelve (12) months prior to the bid or proposal opening date and a valid business license, issued by the corresponding government agency. Post office boxes are not verifiable and shall not be used for the purpose of establishing said physical address. Bidders shall attach to this affidavit of eligibility with a bid or proposal, a copy of a valid business tax receipt or such other documentation, to the city's satisfaction, demonstrating the physical business presence of the firm within corresponding local limits.
- The preference does not apply to goods or services exempted by statute or prohibited by Federal law, State law, or other funding source restrictions.
- The preference established in this policy does not prohibit the right of the City, or other authorized purchasing authority, to compare quality or fitness for use of supplies, materials, equipment and services proposed for purchase and compare qualifications, character, responsibility and fitness of all persons, firms or corporations submitting bids or proposals.
- The information contained herein may be subject to verification.
- A bidder who misrepresents the local preference status of its firm in a proposal or bid submitted to the City of Port Orange will lose the privilege to claim local preference status, and shall lose eligibility to claim local preference for a period of one (1) year. The City Manager may also recommend that the firm be referred for debarment.

As an authorized representative of the firm, I certify that this firm complies fully with the above requirements.

Saboungi Construction, Inc.

Name of Business

By: Hassan SaboungiPrinted Name: Hassan SaboungiTitle: Vice PresidentSTATE OF FloridaCOUNTY OF Volusia

The foregoing instrument was acknowledged before me by means of X physical presence or _____ online notarization, this 19th day of April, 20 , by Hassan Saboungi, as Vice President of Saboungi Construction, Inc., a _____, He or she is X personally known or _____ produced _____ as identification.

Darlene Lou Miles
Notary Public, State of Florida

Printed, typed or stamped name, commission and expiration



2020/ 2021

Volusia County Business Tax Receipt

Issued pursuant to F.S. 205 and Volusia County Code of Ordinances Chapter 114-1 by:
Volusia County Revenue Division - 123 W Indiana Ave, Room 103, DeLand, FL 32720 – (386) 736-5938



Account # 199205280003 Expires: September 30, 2021
Business Location: 290 N US HWY 1

Business Name: SABOUNGI CONSTRUCTION
Owner Name: HASSAN SABOUNGI
Mailing Address: 290 N US HWY 1 STE A
ORMOND BEACH, FL 32174

BUSINESS TYPE	REQ DOC #	CODE	COUNT	TAX
General Contractor Class A	CGC038667	301C	5	\$18.00

- This receipt indicates payment of a tax, which is levied for the privilege of doing the type(s) of business listed above within Volusia County. This receipt is non-regulatory in nature and is not meant to be a certification of the holder's ability to perform the service for which he is registered. This receipt also does not indicate that the business is legal or that it is in compliance with State or local laws and regulations.
- The business must meet all County and/or Municipality planning and zoning requirements or this Business Tax Receipt may be revoked and all taxes paid would be forfeited.
- The information contained on this Business Tax Receipt must be kept up to date. Contact the Volusia County Revenue Division for instructions on making changes to your account.

**THIS PORTION OF THE BUSINESS TAX RECEIPT MUST BE
POSTED CONSPICUOUSLY IN YOUR PLACE OF BUSINESS**

Volusia County Business Tax Receipt

Revenue Division - 123 W Indiana Ave, Room 103, DeLand, FL 32720 – (386) 736-5938

DATE PAID: 07/27/2020
RECEIPT #: BT 1-19-0004796
TOTAL TAX: 18.00
PENALTY: 0.00
TOTAL PAID: 18.00



Business Name: SABOUNGI CONSTRUCTION
Owner Name: HASSAN SABOUNGI
Mailing Address: 290 N US HWY 1 STE A
ORMOND BEACH, FL 32174



Account # 199205280003 Expires: September 30, 2021
Business Location: 290 N US HWY 1

PLEASE DETACH THIS PORTION OF THE BUSINESS TAX RECEIPT FOR YOUR RECORDS



**"ATTACHMENT 1" ITB 21-13 SCHEDULE OF UNIT PRICING
BID FORM
CITY OF PORT ORANGE**

ITB 21-13 Renovation and Expansion of The REC

Completed Attachment 1 Bid Proposal form MUST be included with Bid Submission

Instruction to save Attachment from Demandstar website:
Perform "File Save As" and save spreadsheet to your computer. Fill in pricing in the highlighted cells electronically.

Bidders are required to complete all fields shaded in green. All other fields will be automatically calculated, if submitted electronically.

NAME OF BUSINESS: Saboungi Construction, Inc.

CONTACT PERSON: Hassan Saboungi

EMAIL ADDRESS: info@saboungiconstruction.com

AUTHORIZED SIGNATURE: 

ITEM #	DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	EXTENDED COST
1	Mobilization	1	LS	\$ 132,000.00	\$ 132,000.00
2	Demolition	1	LS	\$ 62,000.00	\$ 62,000.00
3	General Construction	1	LS	\$ 3,697,200.00	\$ 3,697,200.00
Schedule of Additive Alternates					
1	Alt No. 1: Remove & Replace Existing ACU/AHU Equipment in Gym #1	1	LS	\$ 125,800.00	\$ 125,800.00
2	Alt No. 2: Provide Welded Extruded Walkway Cover & Foundation	1	LS	\$ 55,400.00	\$ 55,400.00
3	Alt No. 3: Provide U.V. Filtration System in the new HVAC Systems	1	LS	\$ 11,800.00	\$ 11,800.00
4	Alt No. 4: Provide Automatic Hands-Free Flush Valves on Urinals & Water Closets, Automatic Hands-Free Soap & Paper Towel Dispensers	1	LS	\$ 16,540.00	\$ 16,540.00
5	Alt No. 5: Provide Indoor Play-Structure	1	LS	\$ 50,000.00	\$ 50,000.00
				Additive Alternates Subtotal	\$ 259,540.00
				TOTAL BID	\$ 4,150,740.00
Confirm the number of calendar days to complete upon receipt of PO:				305	Days
Shall warrant all materials, labor and workmanship for the minimum period of:				One (1)	Years
AWARD: THIS BID WILL BE AWARDED TO THE LOWEST, RESPONSIVE, RESPONSIBLE BIDDER					



"ATTACHMENT 1" ITB 21-13 SCHEDULE OF UNIT PRICING
BID FORM

CITY OF PORT ORANGE

ITB 21-13 Renovation and Expansion of The REC

Completed Attachment 1 Bid Proposal form MUST be included with Bid Submission

Perform "File Save As" and save spreadsheet to your computer. Fill in pricing in the highlighted cells electronically.

Bidders are required to complete all fields shaded in green. All other fields will be automatically calculated, if submitted electronically.

NAME OF BUSINESS: Saboungl Construction, Inc.

CONTACT PERSON: Hassan Saboungl, V.P.

EMAIL ADDRESS: Hassan@sabounglconstruction.com

AUTHORIZED SIGNATURE: 

ITEM #	DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	EXTENDED COST
1	Mobilization	1	LS	\$ 126,700.00	\$ 126,700.00
2	Demolition	1	LS	\$ 55,000.00	\$ 55,000.00
3	General Construction	1	LS	\$ 3,541,600.00	\$ 3,541,600.00
Schedule of Additive Alternates					
1	Alt No. 1: Remove & Replace Existing ACU/AHU Equipment in Gym #1	1	LS	\$ 119,610.00	\$ 119,610.00
2	Alt No. 2: Provide Welded Extruded Walkway Cover & Foundation	1	LS	\$ 48,423.00	\$ 48,423.00
3	Alt No. 3: Provide U.V. Filtration System in the new HVAC Systems	1	LS	\$ 8,159.00	\$ 8,159.00
4	Alt No. 4: Provide Automatic Hands-Free Flush Valves on Urinals & Water Closets, Automatic Hands-Free Soap & Paper Towel Dispensers	1	LS	\$ 13,670.00	\$ 13,670.00
5	Alt No. 5: Provide Indoor Play-Structure	1	LS	\$ 50,000.00	\$ 50,000.00
				Additive Alternates Subtotal	\$ 239,862.00
				TOTAL BID	\$ 3,963,162.00
Confirm the number of calendar days to complete upon receipt of PO:				\$ 305.00	Days
Shall warrant all materials, labor and workmanship for the minimum period of:				ONE	Years
AWARD: THIS BID WILL BE AWARDED TO THE LOWEST, RESPONSIVE, RESPONSIBLE BIDDER					



Ron DeSantis, Governor

Halsey Beshears, Secretary



STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

SABOUNGI, HASSAN

SABOUNGI CONSTRUCTION INC
290A NORTH U S HIGHWAY #1
ORMOND BEACH FL 32174-4504

LICENSE NUMBER: CGC038667

EXPIRATION DATE: AUGUST 31, 2022

Always verify licenses online at MyFloridaLicense.com



Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

Request for Taxpayer Identification Number and Certification

► Go to www.irs.gov/FormW9 for instructions and the latest information.

Give Form to the
requester. Do not
send to the IRS.

Print or type.
See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

Saboungi Construction, Inc.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☒ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ►

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ►

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

290A North US Highway 1

6 City, state, and ZIP code

Ormond Beach, FL 32174

7 List account number(s) here (optional)

Requester's name and address (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

____ - ____ - ____

or

Employer identification number

5 9 - 2 2 1 9 0 5 5

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign
Here

Signature of
U.S. person ►

Date ► April 19, 2021

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.

BID BOND

BID BOND

Bond No.: N/A

KNOW ALL MEN BY THESE PRESENTS that Saboungi Construction, Inc, as Contractor, duly authorized to conduct business in the State of Florida, whose principal place of business is located at 290 A North US Highway 1, Ormond Beach, FL 32174, Tel.: 386-672-2077, (hereinafter called "PRINCIPAL"), and Westfield Insurance Company, as SURETY, duly authorized to conduct business in the State of Florida, whose principal place of business is located at PO Box 5001, Westfield Center, OH 44251, Tel.: N/A (hereinafter called "SURETY"), are held and firmly bound unto the City of Port Orange, Florida, as CITY, a Florida municipal corporation, whose address is City of Port Orange, 1000 City Center Circle, Port Orange, Florida 32129, Tel.: (386) 506-5501, (hereinafter called "OBLIGEE" or "CITY"), in the penal sum of Five Percent of Amount Bid dollars and (00)/100 (\$ 5% of Amount Bid), lawful money of the United States, for the payment of which sum shall and truly be made, whereof PRINCIPAL and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that, whereas the Principal has submitted the accompanying bid, dated April 19th, 2021, for:

Project Name / Bid No.: ITB#21-13 - Port Orange Gymnasium Renovation

Project Address: 4655 City Center Circle, Port Orange, FL 32129

Legal Description: 4655 City Center Circle, Port Orange, FL 32129

Description of Work: Port Orange Gymnasium Renovation

NOW, THEREFORE,

A. If the principal shall not withdraw said bid within one hundred twenty (120) days after date of opening of the same, and shall within ten (10) days after the prescribed forms are presented to it for signature, enter into a written contract with the City in accordance with the bid as accepted, and give bonds with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract, then the above obligations shall be void and of no effect, otherwise to remain in full force and virtue.

B. In the event of the withdrawal of said bid within the period specified, or the failure to enter into such contract and give such bonds within the time specified, if the principal shall pay the City the difference between the amount specified in said bid and the amount for which the City may procure the required work and supplies, if the latter amount be in excess of the former, then the above obligations shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above parties have executed this instrument under their several seals, this 19th day of April, A.D. 20 21, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Note: If the firm is a sole ownership or partnership including limited liability company, two (2) witnesses are required to attest the signature. If the firm is a corporation, then the corporate secretary shall attest and affix the corporate seal (Attach power of attorney to original bid bond and financial statement of Surety Company).

PRINCIPAL: Saboungi Construction, Inc

Hassan Saboungi
Signature
Hassan Saboungi, J.P.
Corporate Officer & Title

ATTEST:

Maisa Saboungi
Signature
Maisa Saboungi
Corporate Secretary (Affix Corporate Seal)

WITNESSES:

Darlene Mills
Shirley T. Lisi

SURETY: Westfield Insurance Company

Laura D. Mosholder
Attorney-in-Fact (signature)
Laura D. Mosholder
Name & Title
Laura D. Mosholder
Name of Local Resident Agent
Sanford, FL 32771
City, State, Zip
407-330-3990
Telephone:
A.M. Best No.: A NAIC No.: XV

ATTEST:

Kailee Stone
Signature
Kailee Stone
~~Corporate Secretary~~ (Affix Corporate Seal)
Witness



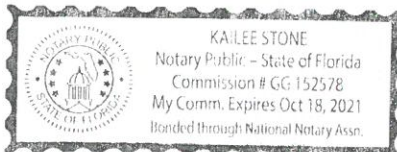
STATE OF Florida

COUNTY OF Palm Beach

Before me this day personally appeared Laura D. Mosholder (affiant), who, being duly sworn, deposes and says that he/she is the Attorney-in-Fact for the Westfield Insurance Company (corporate surety) and that this person has been authorized by Westfield Insurance Company (corporate surety) to execute the foregoing bond on behalf of the Contractor named therein in favor of the City of Port Orange, Florida.

Laura D. Mosholder
Signature of Affiant

Sworn to / Affirmed and subscribed before me this 19th day of April, 20 21, by Laura D. Mosholder who is personally known to me or who produced _____ as identification.



NOTARY PUBLIC - STATE OF

Type or print name: Kailee Stone

Commission No.: GG152578

Commission Expires: 10/18/2021

(Seal)

END OF BID BOND

This document must be completed and returned with your Submittal

General
Power
of Attorney

CERTIFIED COPY

POWER NO. 0994782 01

Westfield Insurance Co.
Westfield National Insurance Co.
Ohio Farmers Insurance Co.
Westfield Center, Ohio

Know All Men by These Presents, That WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY, corporations, hereinafter referred to individually as a "Company" and collectively as "Companies," duly organized and existing under the laws of the State of Ohio, and having its principal office in Westfield Center, Medina County, Ohio, do by these presents make, constitute and appoint
LAURA D. MOSHOLDER, EDWARD M. CLARK, JOINTLY OR SEVERALLY

of **SANFORD** and State of **FL** its true and lawful Attorney(s)-in-Fact, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver **any and all bonds, recognizances, undertakings, or other instruments or contracts of suretyship**.

LIMITATION: THIS POWER OF ATTORNEY CANNOT BE USED TO EXECUTE NOTE GUARANTEE, MORTGAGE DEFICIENCY, MORTGAGE GUARANTEE, OR BANK DEPOSITORY BONDS.

and to bind any of the Companies thereby as fully and to the same extent as if such bonds were signed by the President, sealed with the corporate seal of the applicable Company and duly attested by its Secretary, hereby ratifying and confirming all that the said Attorney(s)-in-Fact may do in the premises. Said appointment is made under and by authority of the following resolution adopted by the Board of Directors of each of the WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY:

"Be It Resolved, that the President, any Senior Executive, any Secretary or any Fidelity & Surety Operations Executive or other Executive shall be and is hereby vested with full power and authority to appoint any one or more suitable persons as Attorney(s)-in-Fact to represent and act for and on behalf of the Company subject to the following provisions:

The Attorney-in-Fact may be given full power and authority for and in the name of and on behalf of the Company, to execute, acknowledge and deliver, any and all bonds, recognizances, contracts, agreements of indemnity and other conditional or obligatory undertakings and any and all notices and documents canceling or terminating the Company's liability thereunder, and any such instruments so executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed by the President and sealed and attested by the Corporate Secretary."

"Be it Further Resolved, that the signature of any such designated person and the seal of the Company heretofore or hereafter affixed to any power of attorney or any certificate relating thereto by facsimile, and any power of attorney or certificate bearing facsimile signatures or facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached." (Each adopted at a meeting held on February 8, 2000).

In Witness Whereof, WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY have caused these presents to be signed by their **National Surety Leader** and **Senior Executive** and their corporate seals to be hereto affixed this **02nd** day of **JANUARY** A.D., **2020**.

Corporate
Seals
Affixed



WESTFIELD INSURANCE COMPANY
WESTFIELD NATIONAL INSURANCE COMPANY
OHIO FARMERS INSURANCE COMPANY

By:
Gary W. Stumper, National Surety Leader and Senior Executive

State of Ohio
County of Medina ss.:

On this **02nd** day of **JANUARY** A.D., **2020**, before me personally came **Gary W. Stumper** to me known, who, being by me duly sworn, did depose and say, that he resides in **Hartford, CT**; that he is **National Surety Leader** and **Senior Executive** of WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY, the companies described in and which executed the above instrument; that he knows the seals of said Companies; that the seals affixed to said instrument are such corporate seals; that they were so affixed by order of the Boards of Directors of said Companies; and that he signed his name thereto by like order.

Notarial
Seal
Affixed



David A. Kotnik, Attorney at Law, Notary Public
My Commission Does Not Expire (Sec. 147.03 Ohio Revised Code)

State of Ohio
County of Medina ss.:

I, **Frank A. Carrino**, Secretary of WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney, executed by said Companies, which is still in full force and effect; and furthermore, the resolutions of the Boards of Directors, set out in the Power of Attorney are in full force and effect.

In Witness Whereof, I have hereunto set my hand and affixed the seals of said Companies at Westfield Center, Ohio, this **19th** day of **April** A.D., **2021**.



Frank A. Carrino, Secretary

EXHIBIT “D”

Application for Payment

Consisting of 1 Page

AIA® Document G702™ - 1992

Application and Certificate for Payment

TO OWNER:	PROJECT:	APPLICATION NO: 001	Distribution to:
FROM CONTRACTOR:	VIA ARCHITECT:	PERIOD TO:	OWNER: ☐
		CONTRACT FOR:	ARCHITECT: ☐
		CONTRACT DATE:	CONTRACTOR: ☐
		PROJECT NOS: / /	FIELD: ☐
			OTHER: ☐

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM \$0.00
2. NET CHANGE BY CHANGE ORDERS \$0.00
3. CONTRACT SUM TO DATE (Line 1 + 2) \$0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) \$0.00
5. RETAINAGE:
 - a. 0 % of Completed Work (Column D + E on G703) \$0.00
 - b. 0 % of Stored Material (Column F on G703) \$0.00

Total Retainage (Lines 5a + 5b or Total in Column I of G703) \$0.00

6. TOTAL EARNED LESS RETAINAGE \$0.00
(Line 4 Less Line 5 Total)

7. LESS PREVIOUS CERTIFICATES FOR PAYMENT \$0.00
(Line 6 from prior Certificate)

8. CURRENT PAYMENT DUE \$0.00

9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6) \$0.00

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$0.00	\$0.00
Total approved this Month	\$0.00	\$0.00
TOTALS	\$0.00	\$0.00
NET CHANGES by Change Order		\$0.00

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR: _____ Date: _____
By: _____
State of: _____
County of: _____
Subscribed and sworn to before me this _____ day of _____

Notary Public: _____
My Commission expires: _____

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED \$0.00
(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT: _____ Date: _____
By: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

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(389ADA53)

EXHIBIT “E”

Waiver and Partial Releases, Final Waivers and Releases of Liens, Contractor’s Affidavit of Outstanding Accounts, Contractor’s Final Payment Affidavit

Consisting of 5 Pages

WAIVER AND RELEASE OF LIEN
UPON PROGRESS PAYMENT
(FLORIDA)

The undersigned lienor, in consideration of the sum of \$ _____, hereby waives and releases its lien and payment bond claims and right to claim a lien for labor, services, and/or materials furnished through _____, 20____, to *[insert the name of your customer]* _____ on the job of *[insert the name of the Owner]* _____ to the following property:

This waiver and release does not cover any retention or labor, services or materials furnished after the date specified.

DATED on _____, 20____.

Witnesses:

[Lienor]

Signature

By: _____

Print Name

Print Name: _____

Signature

Address: _____

Print Name

STATE OF FLORIDA
COUNTY OF _____

Sworn to and subscribed before me this ____ day of _____, 20____, by _____, ☐ who is personally known to be the person described in or ☐ has produced a Florida driver license or ☐ _____ as identification.

Notary Public, State of Florida

Type or Print Name:

My Commission Expires:

Commission Number:

19/5220/610

WAIVER AND PARTIAL RELEASE OF LIEN
UPON PROGRESS PAYMENT
(FLORIDA)

The undersigned lienor, in consideration of the sum of \$ _____, hereby waives and releases its lien and payment bond claims and right to claim a lien for labor, services, and/or materials furnished through _____, 20____, to [insert the name of your customer] _____ on the job of [insert the name of the Owner] _____ to the following property:

This waiver and release does not cover any retention or labor, services, or materials furnished after the date specified.

DATED on _____, 20____.

Witnesses:

[Lienor]

Signature

By: _____

Print Name

Print Name: _____

Signature

Address: _____

Print Name

STATE OF FLORIDA
COUNTY OF _____

Sworn to and subscribed before me this ____ day of _____, 20____, by _____, ☐ who is personally known to be the person described in or ☐ has produced a Florida driver license or ☐ _____ as identification.

Notary Public, State of Florida

Type or Print Name:

My Commission Expires:

Commission Number:

19/5220/611

WAIVER AND RELEASE OF LIEN
UPON FINAL PAYMENT
(FLORIDA)

The undersigned lienor, in consideration of the final payment in the amount of \$_____ hereby waives and releases its lien and payment bond claims and right to claim a lien for labor, services, or materials furnished to _____ (customer) on the job of _____ (owner) to the following described property:

(description of property)

DATED on _____, 20____.

Witnesses:

[Lienor]

Signature _____

By: _____

Print Name: _____

Print Name _____

Address: _____

Signature _____

Print Name _____

STATE OF FLORIDA
COUNTY OF _____

Sworn to and subscribed before me this ____ day of _____, 20____, by _____, ☐ who is personally known to be the person described in or ☐ has produced a Florida driver license or ☐ _____ as identification.

Notary Public, State of Florida

Type or Print Name:

My Commission Expires:

Commission Number:

PROJECT: _____

CONTRACTOR'S AFFIDAVIT OF OUTSTANDING ACCOUNTS

To the best of my knowledge and belief, we hereby certify that all estimates of work shown on the application for payment Number ____ dated _____ are true and correct, that all work has been performed and material supplied in full accordance with the terms and conditions of the Agreement with Owner and all authorized changes thereto, that the following is a true and correct statement of the contract account up to and including the last day of the period covered by this estimate and that no part of the Payment Due This Estimate has been received.

	(Must match Pay Requisition)	(Owner Use Only)
ORIGINAL CONTRACT AMOUNT:	\$ _____	\$ _____
APPROVED CHANGE ORDERS:	\$ _____	\$ _____
ADJUSTED CONTRACT AMOUNT:	\$ _____	\$ _____

WORK COMPLETED TO DATE:	\$ _____	\$ _____
(on contract)		
Net Change (add/deduct)	\$ _____	\$ _____
Total Work Completed to Date	\$ _____	\$ _____
Less Retainage	\$ _____	\$ _____
Total Owed to Date	\$ _____	\$ _____
Less Prior Billings	\$ _____	\$ _____
<u>PAYMENT DUE THIS ESTIMATE:</u>	\$ _____	\$ _____

AFFIDAVIT OF OUTSTANDING ACCOUNTS

We hereby certify that all outstanding claims for labor, insurance, unemployment benefits, taxes, union benefits, subcontract materials, expendable equipment, and any and all other obligations incurred in the performance of said agreement have been paid in full in accordance with the requirements of said agreement except such outstanding claims as are listed below, which statement contains all claims against Contractor which are not yet paid. (All amounts owed, even if under extended periods of credit, must be included in this statement.) We also certify that these due and payable accounts will be paid as shown below out of funds to be received from the Owner for this period and signed Releases of Lien will be presented to Owner for each of the below listed Suppliers/Subcontractors.

Subcontractor/ Supplier Name	Type of Material or Labor Furnished	Contract Price (if applicable)	Amount Previously Paid	Amount to be Paid by Contractor to Subcontractor/ Supplier out of this Payment	Balance Owed Subcontractor/ Supplier After this Payment

The undersigned Contractor, having heretofore entered into a Contract with Owner to perform work in connection with the above project, and having made Affidavit of Outstanding Accounts in connection with request for payment in order to induce Owner to make a payment at this time in the amount indicated above, agrees as follows:

- That said payment is in strict compliance with the terms and conditions of said contract.
- That said payment shall be received as a trust fund and applied by the undersigned for the discharge of his obligations for labor, subcontract work, materials, equipment, supplies, services, etc. in connection with this project.
- That said payment will not be deposited with any depository to whom the Contractor has given any evidence of an indebted which gives to the depository any legal rights to such funds or any part thereof.
- That the person executing this Certificate on behalf of the Contractor is an authorized officer of the Contractor, having knowledge of all the matters hereinabove set forth and is duly authorized to execute this Certificate and bind the Contractor.

Dated this _____ day of _____, 20____.

STATE OF _____
COUNTY OF _____

Subscribed and sworn to before me this
_____ day of _____, 20____.

Notary Public
My Commission Expires: _____

(CONTRACTOR)

By: _____
(undersigned)

Title: _____

CONTRACTOR'S FINAL PAYMENT AFFIDAVIT
(FLORIDA)

STATE OF FLORIDA

COUNTY OF _____

BEFORE ME, the undersigned authority, duly authorized to administer oaths and take acknowledgments, personally appeared _____, who being duly sworn, deposes and says:

1. He is the _____ of _____ ("Contractor").

2. This Affidavit is made pursuant to Chapter 713, Florida Statutes, in connection with labor, services and materials supplied for improvement of the following described real property under the direct contract between _____ ("Owner") and Contractor:

3. All lienors under the direct contract have been paid in full for labor, services and/or materials, except as follows:

Lienor's Name and Address

Amount Due or to Become Due

Contractor

By: _____
Print Name:

STATE OF FLORIDA

COUNTY OF _____

Sworn to and subscribed before me this _____ day of _____, 20____, by _____, ☐ who is personally known to be the person described in or ☐ has produced a Florida driver license or ☐ _____ as identification.

Notary Public, State of Florida

Type or Print Name:

My Commission Expires:

Commission Number:

EXHIBIT “F”

Contract Completion Checklist

Consisting of 1 Page

Contract Completion Checklist

C.I.P.# / PROJECT DESCRIPTION:

CONTRACTOR:

Original Contract Sum

Change Orders

Final Contract Sum

	<u>Approved</u>	<u>Date</u>
1 Scope Summary	Contractor _____ Architect/Engineer _____ Owner _____	_____ _____ _____
2 Substantial Completion Certificate	Contractor _____ Architect/Engineer _____ Owner _____	_____ _____ _____
3 Punch List	Contractor _____ Architect/Engineer _____ Owner _____	_____ _____ _____
4 Certificate of Occupancy:	Contractor _____ Architect/Engineer _____ Owner _____	_____ _____ _____
5 Operation, Maintenance & Training Manuals:	Contractor _____	_____
a. 1 Complete set of all Operations & Maintenance Manuals	Architect/Engineer _____	_____
b. Copies of Maintenance Agreements	Owner _____	_____
6 Warranties / Guarantees	Contractor _____	_____
a. 2 Complete Sets of all Warranty / Guarantee Documents	Architect/Engineer _____	_____
	Owner _____	_____
7 Consent of Surety:	Contractor _____ Architect/Engineer _____ Owner _____	_____ _____ _____
8 Affidavits & Final Lien Waivers:	Contractor _____ Architect/Engineer _____ Owner _____	_____ _____ _____



OPENING DATE/TIME: April 19, 2021 @ 2:30PM

Bid Tabulation

ITB 21-13 Renovation and Expansion of The REC

				Saboungi Construction, Inc.		A.G. Pifer Construction Co., Inc.		Keator Construction LLC		Johnson-Laux Construction, LLC		Paul Culver Construction, Inc.	
				Ormond Beach, FL		Daytona Beach, FL		Ocoee, FL		Winter Garden, FL		Daytona Beach, FL	
ITEM #	DESCRIPTION	Quantity	Unit of Measure	Total Unit Cost	Extended Cost	Total Unit Cost	Extended Cost	Total Unit Cost	Extended Cost	Total Unit Cost	Extended Cost	Total Unit Cost	Extended Cost
1	Mobilization	1	LS	\$ 126,700.00	\$ 126,700.00	\$ 280,000.00	\$ 280,000.00	\$ 10,000.00	\$ 10,000.00	\$ 50,000.00	\$ 50,000.00	\$ 68,000.00	\$ 68,000.00
2	Demolition	1	LS	\$ 55,000.00	\$ 55,000.00	\$ 120,000.00	\$ 120,000.00	\$ 30,000.00	\$ 30,000.00	\$ 33,500.00	\$ 33,500.00	\$ 37,625.00	\$ 37,625.00
3	General Construction	1	LS	\$ 3,541,600.00	\$ 3,541,600.00	\$ 4,265,000.00	\$ 4,265,000.00	\$ 3,685,000.00	\$ 3,685,000.00	\$ 4,133,196.00	\$ 4,133,196.00	\$ 4,035,608.00	\$ 4,035,608.00
Schedule of Additive Alternates													
1	Alt No. 1: Remove & Replace Existing ACU/AHU Equipment in Gym #1	1	LS	\$ 119,610.00	\$ 119,610.00	\$ 122,774.00	\$ 122,774.00	\$ 110,000.00	\$ 110,000.00	\$ 113,268.00	\$ 113,268.00	\$ 114,530.00	\$ 114,530.00
2	Alt No. 2: Provide Welded Extruded Walkway Cover & Foundation	1	LS	\$ 48,423.00	\$ 48,423.00	\$ 46,816.00	\$ 46,816.00	\$ 50,000.00	\$ 50,000.00	\$ 40,128.00	\$ 40,128.00	\$ 45,210.00	\$ 45,210.00
3	Alt No. 3: Provide U.V. Filtration System in the new HVAC Systems	1	LS	\$ 8,159.00	\$ 8,159.00	\$ 14,952.00	\$ 14,952.00	\$ 15,000.00	\$ 15,000.00	\$ 6,712.00	\$ 6,712.00	\$ 117,285.00	\$ 117,285.00
4	Alt No. 4: Provide Automatic Hands-Free Flush Valves on Urinals & Water Closets, Automatic Hands-Free Soap & Paper Towel Dispensers	1	LS	\$ 13,670.00	\$ 13,670.00	\$ 10,412.00	\$ 10,412.00	\$ 10,000.00	\$ 10,000.00	\$ 4,828.00	\$ 4,828.00	\$ 10,225.00	\$ 10,225.00
5	Alt No. 5: Provide Indoor Play-Structure	1	LS	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 55,000.00	\$ 55,000.00	\$ 50,000.00	\$ 50,000.00	\$ 55,000.00	\$ 55,000.00
				Additive Alternates Subtotal	\$ 239,862.00	Additive Alternates Subtotal	\$ 244,954.00	Additive Alternates Subtotal	\$ 240,000.00	Additive Alternates Subtotal	\$ 214,936.00	Additive Alternates Subtotal	\$ 342,250.00
				TOTAL BID	\$ 3,963,162.00	TOTAL BID	\$ 4,909,954.00	TOTAL BID	\$ 3,965,000.00	TOTAL BID	\$ 4,431,632.00	TOTAL BID	\$ 4,483,483.00
				Confirm the number of calendar days to complete upon receipt of PO:	305 DAYS	Confirm the number of calendar days to complete upon receipt of PO:	395 DAYS	Confirm the number of calendar days to complete upon receipt of PO:	300 DAYS	Confirm the number of calendar days to complete upon receipt of PO:	305 DAYS	Confirm the number of calendar days to complete upon receipt of PO:	305 DAYS
				Shall warrant all materials, labor and workmanship for the minimum period of:	1 YEAR	Shall warrant all materials, labor and workmanship for the minimum period of:	1 YEAR	Shall warrant all materials, labor and workmanship for the minimum period of:	1 YEAR	Shall warrant all materials, labor and workmanship for the minimum period of:	1 YEAR	Shall warrant all materials, labor and workmanship for the minimum period of:	1 YEAR
Required Forms Submitted:				YES		YES		YES		YES		YES	
Bid Bond Submitted:				YES		YES		YES		YES		YES	
Responsive & Responsible Bidder:				YES		YES		YES		YES		YES	

DISCLAIMER: THIS BID TABULATION INDICATES ONLY THE BIDS AS RECEIVED. ALL BIDS ARE SUBJECT TO VERIFICATION FOR ACCURACY, AND FOR SPECIFICATION AND CONTRACT COMPLIANCE. NO CONCLUSIONS ABOUT CONTRACT AWARDS SHOULD BE DRAWN FROM THESE PRELIMINARY TABULATIONS

CITY OF PORT ORANGE, FLORIDA

INVITATION TO BID

ITB #21-13

RENOVATION AND EXPANSION OF THE REC



City of Port Orange Purchasing Division

Prepared by: Michael Hall, Purchasing Agent

Release Date: March 12, 2021

Bid Due Date and Time: April 19, 2021 at 2:30 P.M.

City of Port Orange, Florida

1000 City Center Circle

Port Orange, FL 32129

(386) 506-5740

purchdiv@port-orange.org

www.port-orange.org



Legal Notice to Bidders

ITB 21-13

RENOVATION AND EXPANSION OF THE REC

Notice is hereby given that the City of Port Orange is soliciting bids for ITB 21-13 RENOVATION AND EXPANSION OF THE REC. Bids will be accepted in the City Clerk's Office, Port Orange City Hall, 1000 City Center Circle, Port Orange, Florida 32129 until **2:30 P.M. on April 19, 2021** which may be amended by addendum issued by the City. All untimely Bids will not be considered and will be returned to the Bidder unopened. All Bids will be evaluated to ensure they contain all required forms in order to deem the Bidder responsive or non-responsive. **Bids will be opened and read aloud at 2:30 P.M. in Council Chambers.**

There will be a Mandatory Pre-Bid Conference and Site Visit for the project at **10:00 A.M. (local time) on March 26, 2021** and an **Optional Pre-Bid Meeting and Site Visit following the Pre-Bid Conference at 10:00 A.M. (local time) on March 29, 2021** at City Hall, Council Chambers (1st floor), 1000 City Center Circle, Port Orange, Florida 32129. All attendees to the Pre-Bid Conference must sign in. The representative of each Bidder shall be an authorized employee of the Bidder and shall sign in accordingly. **All Bidders must attend either one of the Mandatory Pre-Bid Conference and Site Visit.** Failure to sign in and attend the entire Mandatory Pre-Bid and Site Visit Conference shall result in disqualification of the submitted bid. Only Bidders attending a Mandatory Pre-Bid and Site Visit Conference will be eligible to submit a bid. **Bidders are urged to obtain Bid documents and familiarize themselves with the documents prior to the Pre-Bid meeting.**

There will be a Pre-Construction meeting scheduled after the award of contract. The location will be at City Hall location, Council Chambers (1st floor), 1000 City Center Circle, Port Orange, Florida 32129 and the time and date TBD.

A Bid Guarantee in the form of a Bid Bond executed by the Bidder and an acceptable surety or a certified check or bank draft payable to the City of Port Orange, Florida in an amount equal to five percent (5%) of the proposed bid shall be submitted with each submission.

DESCRIPTION: *The City of Port Orange is soliciting sealed Bids to acquire the services for the renovation and expansion of the current Port Orange Gymnasium/REC, located at 4655 City Center Cir, Port Orange, FL 32129.*

Bidders must be a licensed and certified general contractor and entity licensed to do business in the State of Florida and perform the services identified herein. Bidders must be properly registered and licensed to provide the goods or services identified in the scope of work, by all applicable state and local agencies.

All Bids are solicited and shall be made pursuant to the Code of Ordinances, City of Port Orange, Chapter 2, Article VI, Division 2, Section 2-256, and all Bids will be evaluated in accordance with the provisions thereof. Code of Ordinances, City of Port Orange is on file in the Office of the City Clerk, City Hall, 1000 City Center Circle, Port Orange, Florida 32129, and at www.municode.com. Local bidders may be given a local preference pursuant to the Code of Ordinances, City of Port Orange, Chapter 2, Article VI, Division 2, Section 2-275.

Copies of the Bid documents, requirements, the scope of service and all other pertinent information necessary to submit a complete package may be obtained electronically from the City of Port Orange website at www.port-orange.org/bids.aspx and DemandStar via their website at www.demandstar.com. All questions shall be directed **in writing** to the Purchasing Agent, Michael Hall, mhall@port-orange.org or purchdiv@port-orange.org and reference **"Questions on ITB 21-13 RENOVATION AND EXPANSION OF THE REC"** in the subject line. Last day for questions is **April 5, 2021 at 5:00 P.M.**

All Bidders are required to complete and submit a Public Entity Crime Statement, the Anti-Collusion Statement, and Drug-Free Tie Proposal Preference Statement, as well as other documents as required by the solicitation.

NO bid shall be withdrawn for a period of ninety (90) days subsequent to the bid opening without the consent of the City of Port Orange, Florida. Upon award, the successful bidder will also be required to furnish and pay for a satisfactory contract one hundred percent (100%) Payment and Performance Bond to be recorded by the City, with the Clerk of the Circuit Court, Volusia County, Florida and to enter into a contract for services with the City of Port Orange.

No Bids received after the time and date specified for the opening will be considered. The City of Port Orange, Florida reserves the right to reject any and all Bids, to waive any and all non-substantial irregularity in Bids received, whenever such waiver or rejection is in the best interest of the City.

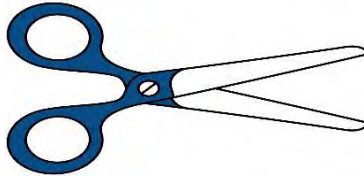
Bids shall be **submitted to the City Clerk's office** with one (1) original and one (1) identical digital (CD or flash drive) version in PDF format, addressed to Michael Hall, Purchasing Agent, Finance Department, City Hall, 1000 City Center Circle, Port Orange, Florida 32129 in a **SEALED ENVELOPE/PACKAGE** plainly marked on the outside: **"ITB 21-13 RENOVATION AND EXPANSION OF THE REC"**.

Michael Hall – Purchasing Agent

Legal Ad - One Time – March 12, 2021

[Remainder of this page left intentionally blank]

Cut along the outer border and affix this label to the outside of your sealed bid envelope/package to identify it as a "Sealed Bid". Be sure to include the name of the company submitting the bid where requested.



SEALED BID • DO NOT OPEN	
SEALED BID NO.	ITB 21-13
BID TITLE:	RENOVATION AND EXPANSION OF THE REC
DUE DATE/TIME:	April 19, 2021 at 2:30 P.M.
SUBMITTED BY:	(Name of Company)
DELIVER TO:	City of Port Orange City Clerk's Office Attn: Michael Hall Purchasing Agent Finance Department 1000 City Center Circle Port Orange, Florida 32129
DATE/TIME RECEIVED:	(To be stamped by Clerk's Office)

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SECTION 1 – PURPOSE AND OVERVIEW

The purpose of this Invitation to Bid (ITB) is to solicit competitive sealed bids from a licensed and certified general contractor for the provision of acquiring the services to renovate and expand the Port Orange Gymnasium/REC, located at 4655 City Center Cir, Port Orange, FL 32129.

Bidders must be a licensed and certified general contractor and commercial entity licensed to do business in the State of Florida and perform the services identified herein and properly registered and licensed to provide the goods or services identified in the scope of work, by all applicable state and local agencies.

It is the intent and purpose of the City of Port Orange (City) that this Invitation to Bid promotes competitive selection. It shall be the Bidder's responsibility to advise the Purchasing Division if any language, requirements, etc., or any combination thereof, inadvertently restricts or limits the requirements stated in this ITB to a single source.

[Remainder of this page left intentionally blank]

SECTION 2 – INSTRUCTIONS TO BIDDERS

Firms or companies (Bidders) desiring to provide services, as described herein shall submit sealed bids, including one original copy and one (1) digital (CD or flash drive) version in PDF format, in conformance with the detailed submittal instructions.

TIMELINE (Local Time)

The City reserves the right to alter dates as needed.

Date of Distribution.....March 12, 2021
Mandatory Pre-Bid Conference and Site Visit:.....March 26, 2021 at 10:00 A.M.
Optional Pre-Bid Conference and Site Visit:March 29, 2021 at 10:00 A.M.
Deadline for Questions:April 5, 2021 at 10:00 A.M.
Final Addendum Posting:April 12, 2021 by 5:00 P.M.
Bids Due:April 19, 2021 by 2:30 P.M.
City Council Meeting for Approval of Recommendation of Award.....To Be Determined

Bids must be delivered in a sealed envelope/package and delivered to:

City of Port Orange City Clerk's Office
Attn: Michael Hall
Purchasing Agent
Finance Department
1000 City Center Circle
Port Orange, Florida 32129

Sealed Bids must be delivered no later than the date and time listed in the Timeline above. All times referenced are local time.

Bids shall be sealed, and Bidders shall clearly indicate on the outside of their bid the following:

- a) Invitation to Bid (ITB) Number and Title
- b) Date of Opening
- c) Name of Bidder
- d) Address of Bidder

Due to the timing of mail service, the City cautions Bidders to assure actual delivery of Bids to the City prior to the deadline set for receiving bids. Carrier and hand deliveries of bids will be accepted in the City Clerk's Office, Port Orange City Hall, 1000 City Center Circle, Port Orange, Florida 32129 until the date and time referenced in the Timeline above or as amended by addendum issued by the City. Bids received after the established deadline shall not be considered.

Bidders are cautioned that they are responsible for delivery to the specific location cited above. Therefore, if your bid, proposal, statement, or quotation is delivered by an express mail carrier or by any other means, it is your responsibility to ensure delivery to the above address. This office will not be responsible for deliveries made to any place other than the specified address.

Offers by telephone, email or telegram shall not be accepted. Also, Bidders are instructed NOT to fax their bid package. **Faxed bids shall be rejected as non-responsive regardless of where or when the fax is received.**

All Bids will be opened publicly, and the names of all Bidders shall be read aloud. All conferences and meetings regarding this ITB are recorded electronically (audio only).

The City of Port Orange reserves the right to reject any or all Bids or parts of Bids if it is in the best interest of the City.

PRE-BID CONFERENCE/SITE VISIT

There will be a Mandatory Pre-Bid Conference and Site Visit and an Optional Pre-Bid Conference and Site Visit for the project on the date and time referenced in the Timeline above at City Hall, Council Chambers (1st Floor), 1000 City Center Circle, Port Orange, Florida 32129. **All prospective Bidders must attend either one of the meetings.** All attendees to the Mandatory Pre-Bid Conference and Site Visit must sign in. The representative of each Contractor shall be an authorized employee of the company and shall sign in accordingly. Failure to sign in and attend either of the Mandatory Pre-Bid Conference shall result in disqualification of submitted bids. **Only firms attending a Mandatory Pre-Bid Conference will be eligible to submit a bid.**

QUESTIONS REGARDING THIS ITB

All questions shall reference "ITB 21-13 RENOVATION AND EXPANSION OF THE REC" in the subject line. All questions concerning this ITB shall be submitted in writing no later than the date and time referenced in the Timeline above to:

Michael Hall
Purchasing Agent
1000 City Center Circle
Port Orange, FL 32129
mhall@port-orange.org or
purchdiv@port-orange.org

ADDENDA REGARDING THE INVITATION TO BID

The City will issue responses to inquiries and any other corrections or amendments it deems necessary in written addenda issued prior to the Bid Due Date. Bidders should not rely on any representations, statements, or explanations other than those made in this ITB or in any addendum to this ITB. Where there appears to be a conflict between the ITB and any addenda issued, the last addendum issued will prevail.

It is the Bidders' responsibility to be sure all correct number of addenda was received. The Bidders should verify with the designated contact persons prior to submitting a Bid that all addenda have been received. Bidders should acknowledge the correct number of addenda received as part of their Bids. It is the responsibility of the Bidders to ensure all addenda have been received prior to submitting a bid.

Written responses, in the form of an addendum, will be provided via the City website www.port-orange.org/bids.aspx and Demand Star websites. www.demandstar.com.

The City of Port Orange reserves the right to consider the omission of an acknowledgment of addendum as cause for rejection of the ITB submittal.

This provision exists solely for the convenience and administrative efficiency of the City of Port Orange. No Bidders or other third party gains any rights by virtue of this provision or the application thereof, nor shall any Bidders or third party have any standing to sue or cause of action arising therefrom.

CLARIFICATIONS

It is the Bidders' responsibility to become familiar with and fully informed regarding the terms, conditions and specifications of this ITB. Lack of understanding and/or misinterpretation of any portions of this ITB shall not be cause for withdrawal of your Bid after opening or for subsequent protest of award. Bidders must contact the Purchasing Representative, at the email provided, should clarification be required.

Modification or alteration of the documents contained in the solicitation or contract shall only be valid if mutually agreed to in writing by the parties.

MINIMUM QUALIFICATIONS

Bidders shall be licensed and certified general contractor and licensed to do business in the State of Florida. Submit Sunbiz report showing your company registered as "Active".

Bidders must be a licensed and certified general contractor and commercial entity licensed to do business in the State of Florida and perform the services identified herein and properly registered and licensed to provide the goods or services identified in the scope of work, by all applicable state and local agencies. Bidders shall provide documentation that demonstrates experience in the erection and installation of similar structures.

Bidders must provide a minimum of three (3) verifiable references from similar scopes of work as identified in this ITB on the provided "Professional References" form. Failure to provide references that verify required experience will cause the Bidders to be deemed non-responsive. The City of Port Orange is not to be used as a reference.

NO LOBBYING

All Bidders are hereby placed on notice that the City of Port Orange Council, City Employees/Staff, nor Members of the Evaluation Committee (with the exception of the City of Port Orange Purchasing Division personnel designated to receive requests for interpretations or corrections) are not to be lobbied, directly or indirectly either individually or collectively, regarding this ITB. During the entire procurement process, all Bidders and their subcontractors, sub-consultants, or agents are hereby placed on notice that they are not to contact any persons listed above for such purposes as holding meetings of introduction, dinners, etc. if they intend to submit or have submitted Bids for this project. Any Bidders contacting individuals mentioned herein in violation of this warning may automatically be disqualified from further consideration for this ITB.

PRICING SHEETS

Pricing sheets/Bid Forms are to be completed as directed and without modification and returned as part of the ITB submittal prior to the ITB deadline for submission. Failure to fill out the price sheets/bid forms as directed and without modification may negatively affect the evaluation of your bid.

EXCEPTIONS TO SPECIFICATIONS

If taking exception to any portion of the ITB specifications, the Bidders must indicate those exceptions as stated on the Bidders' Acknowledgement Form.

BID SUBMISSION AND WITHDRAWAL

Unless otherwise specified, Bidders shall use the forms supplied by the Purchasing Division. Bids, once opened, become the property of the City, cannot be withdrawn, and will not be returned to the Bidders. Upon opening, Bids become subject to public disclosure in accordance with Chapter 119, Florida Statutes.

CORRECTION OF BIDS

Correction of inadvertently erroneous Bids shall be permitted up to the time of ITB opening. Bidders shall not be allowed to modify their Bids after the opening time and date.

WITHDRAWAL OF BIDS

NO Bid shall be withdrawn for a period of ninety (90) days subsequent to the Bid opening without the consent of the City of Port Orange, Florida. Negligence on the part of the Bidders in preparing the Bid confers no right of withdrawal or modification after the Bid has been opened, at the appointed time and place by the City of Port Orange. Any such withdrawn Bid shall not be resubmitted.

OPENING OF BIDS

Bids will be received until the date and time stated in this ITB and will be publicly opened and read at the place, time and date stated. No responsibility will attach the Purchasing Department for the premature opening of a Bid not properly addressed and identified.

LITIGATION HISTORY

The City will consider a Bidders' litigation history information in its review and determination of responsibility. All Bidders are required to disclose to the City all "material" cases filed, pending, or resolved during the last five (5) years prior to the solicitation response due date, whether such cases were brought by or against the Bidders, any parent or subsidiary of the Bidders, or any predecessor organization. If the Bidders is a joint venture, the information provided should encompass the joint venture (if it is not newly formed for purposes of responding to the solicitation) and each of the entities forming the joint venture. Although the review of a Bidders' litigation history is an issue of responsibility, the failure to provide litigation history as required in the Evaluation Criteria may result in a recommendation of non-responsive by the Purchasing Manager.

DEBARMENT HISTORY

The City will consider a Bidders' debarment history information in its review and determination of responsibility. All Bidders are required to disclose to the City all cases of debarment filed, pending, or resolved by the City or other public entity during the last five (5) years prior to the solicitation response due date, whether such actions were brought by or against the Bidders, any parent or subsidiary of the Bidders, or any predecessor organization. If the Bidder is a joint venture, the information provided should encompass the joint venture (if it is not newly formed for purposes of responding to the solicitation) and each of the entities forming the joint venture. Although the review of a Bidders' debarment history is an issue of responsibility, the failure to provide debarment history as required in the Proposal Submittal and Requirements Section may result in a recommendation of non-responsive by the Purchasing Manager.

REJECTION OF BIDS

The City reserves the right to reject any and/or all Bids when such rejection is in the best interest of the City.

BIDS MAY BE REJECTED AND/OR BIDDERS DISQUALIFIED FOR THE FOLLOWING REASONS

- (a) Failure to update the information on file including address, product, service or business descriptions.
- (b) Failure to perform according to contract provisions.
- (c) Conviction in a court of law of any criminal offense in connection with the conduct of business.
- (d) Evidence of a violation of any federal or state antitrust law based on the submission of bids or proposals, or the awarding of contracts.
- (e) Evidence that the Bidder has attempted to give a Board employee a gratuity of any kind for the purpose of influencing a recommendation or decision in connection with any part of the Board's purchasing activity.
- (f) Other reasons deemed appropriate by the City.

OWNERSHIP OF DOCUMENTS

All documents resulting from this project will become the sole property of the City of Port Orange. The Bidders must meet all requirements for retaining public records and transfer, at no cost, to the City all public records in the possession of the Bidders upon termination of this Agreement and destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. All records stored electronically must be provided to the City in a format that is compatible with the information technology systems of the City.

AMERICANS WITH DISABILITIES ACT (ADA)

If you need special services provided for under the Americans with Disabilities Act, contact the ADA Coordinator in our Human Resources office at 386-506-5560 at least 48 hours before the scheduled event.

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SECTION 3 – SCOPE OF WORK

SUMMARY OF WORK:

This is for the renovation and expansion of the **Port Orange Gymnasium/REC**. The work consists of furnishing all labor, equipment, and materials in accordance with Section 3, Scope of Work and the Drawings in "Attachment A" attached herein.

Drawings, Specifications, Requirements:

See Pages 13-641 (Specifications) & 708-788 (Drawings) of this solicitation or copy & paste the following link for documents: <https://www.port-orange.org/bids.aspx>

Document Title:

- **“Attachment A” ITB 21-13 Bid Set - Drawings for Renovation and Expansion of the REC**

You can find the aforementioned documents on the City of Port Orange website at the link above.

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284621 ADDRESSABLE FIRE-ALARM SYSTEM

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. Project Identification: The REC.

B. Owner: City of Port Orange.

1. Owner's Representative: Susan Lovallo.

C. Architect: DJdesign Services, Inc.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. Drawings and Specifications.

B. Type of Contract.

1. Project will be constructed under a single prime contract.

C. General Conditions:

1. City of Port Orange, Standard Service Agreement.

1.4 PHASED CONSTRUCTION

- A. Construction work in the building shall be done without disturbance to adjacent ongoing activities. Access shall remain unimpeded during construction.

1.5 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7 a.m. to 5 p.m., Monday through Friday, except as otherwise indicated.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor air intakes.
- F. Controlled Substances: Use of tobacco products and other controlled substances on the Project site is not permitted.
- G. Owner shall reserve the right to remove contractor's personnel from jobsite who are deemed not to have the best interest of the owner.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ADDITIVE ALTERNATES

1. Alternate No. 1: Remove and replace existing ACU/AHU equipment in Gym #1.
2. Alternate No. 2: Provide welded extruded walkway cover and foundation.
3. Alternate No. 3: Provide U.V. Filtration System in the new HVAC systems.
4. Alternate No. 4: Provide automatic handsfree flush valves on urinals and water closets, automatic handsfree soap and paper towel dispensers.
5. Alternate No. 5: Provide indoor play-structure allowances of \$50,000.00

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Section:
 - 1. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1.3 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A or similar form.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication, or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

- i. Research reports evidencing compliance with building code in effect for Project, from Florida Building Code.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution will not adversely affect Contractor's construction schedule.

- c. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - d. Requested substitution is compatible with other portions of the Work.
 - e. Requested substitution has been coordinated with other portions of the Work.
 - f. Requested substitution provides specified warranty.
 - g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed, unless otherwise indicated.
- C. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Requests for Information (RFIs).
 - 2. Owner/Architect/Contractor Project meetings. (OAC)

1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during construction.
- B. OAC: Owner, Architect and Contractor meetings held on a regular basis.

1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.

5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities.

1.4 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Drawing number and detail references, as appropriate.
 9. Field dimensions and conditions, as appropriate.
 10. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 11. Contractor's signature.
 12. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- D. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly.

1.5 PROJECT MEETINGS (OAC)

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.

- k. Preparation of record documents.
 - l. Use of the premises and existing building.
 - m. Work restrictions.
 - n. Working hours.
 - o. Owner's occupancy requirements.
 - p. Responsibility for temporary facilities and controls.
 - q. Procedures for moisture and mold control.
 - r. Procedures for disruptions and shutdowns.
 - s. Construction waste management and recycling.
 - t. Parking availability.
 - u. Office, work, and storage areas.
 - v. Equipment deliveries and priorities.
 - w. First aid.
 - x. Security.
 - y. Progress cleaning.
3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Progress Meetings: Conduct progress meetings at biweekly intervals.

- 1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
- 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.

- 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Daily construction reports.
 - 3. Field condition reports.
- B. Related Section:
 - 1. Division 01 Section "Multiple Contract Summary" for preparing a combined Contractor's Construction Schedule.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. PDF electronic file.
 - 2. Two paper copies.
- B. Start-up Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 3. Total Float Report: List of all activities sorted in ascending order of total float.
- E. Daily Construction Reports: Submit at weekly intervals.
- F. Field Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's construction schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
1. Secure time commitments for performing critical elements of the Work from entities involved.
 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.

2. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 3. Startup and Testing Time: Include not less than 15 days for startup and testing.
 4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 5. Punch List and Final Completion: Include not more than 30 days for punch list and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 5. Work Stages: Indicate important stages of construction for each major portion of the Work.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered RFIs.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
- F. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule.
- G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice of Award.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. Equipment at Project site.
 - 5. Material deliveries.
 - 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 - 7. Accidents.
 - 8. Meetings and significant decisions.
 - 9. Unusual events.
 - 10. Stoppages, delays, shortages, and losses.
 - 11. Meter readings and similar recordings.
 - 12. Emergency procedures.
 - 13. Orders and requests of authorities having jurisdiction.
 - 14. Change Orders received and implemented.
 - 15. Construction Change Directives received and implemented.
 - 16. Services connected and disconnected.
 - 17. Equipment or system tests and startups.
 - 18. Partial completions and occupancies.
 - 19. Substantial Completions authorized.
- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections:
 - 1. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 2. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 3. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
 - 1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.

- a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Contractor shall execute a data licensing agreement in the form of an Agreement form acceptable to the Owner and Architect.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's Construction Manager's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect
 - 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).

- j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Other necessary identification.
- E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
- 1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01A).
 - 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
 - 4. Include the following information on an inserted cover sheet:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of firm or entity that prepared submittal.
 - g. Name of subcontractor.
 - h. Name of supplier.
 - i. Name of manufacturer.
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Other necessary identification.
- F. Options: Identify options requiring selection by the Architect.
- G. Deviations: Identify deviations from the Contract Documents on submittals.
- H. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
- 1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
- I. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- L. Use for Construction: Use only final submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements:
1. Submit electronic submittals via email as PDF electronic files.
 - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 2. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
 4. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based upon Architect's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 42 inches (750 by 1067 mm).
 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.

- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit two sets of Samples. Architect will retain one Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project record sample.
 - 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Submit product schedule in the following format:
 - a. PDF electronic file.
- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."
- H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A.
 1. Submit subcontractor list in the following format:
 - a. PDF electronic file.
 - b. Number of Copies: Three paper copies of subcontractor list, unless otherwise indicated. Architect will return two copies.
 - c. List shall include the following trades:
 - Selective Demolition
 - Landscaping/Irrigations
 - Metal Stud Framing and Dry Wall
 - Acoustical Grid and Ceiling Tile
 - Millwork
 - Membrane Roofing and Accessories
 - Plumbing
 - HVAC
 - Electrical
 - Painting
 - Flooring
 - Concrete Placement and Finishing
 - Aluminum Storefront Systems
 - Rough Carpentry
 - Structural Steel Fabrications and Installation
- J. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

- M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- R. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- T. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
 - 1. Reviewed
 - 2. Rejected
 - 3. Submit Specific Item

4. Furnish as corrected
 5. Revise and Re-Submit.
- C. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it or will return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.
- D. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections:
 - 1. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Laboratory Mockups: Full-size, physical assemblies constructed at testing facility to verify performance characteristics.
- D. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of FIVE previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.
 - 1. Seismic-force resisting system, designated seismic system, or component listed in the designated seismic system quality assurance plan prepared by the Architect.

2. Main wind-force resisting system, or a wind-resisting component listed in the wind-force-resisting system quality assurance plan prepared by the Architect.
- B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

- B. **Manufacturer Qualifications:** A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. **Fabricator Qualifications:** A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. **Installer Qualifications:** A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. **Professional Engineer Qualifications:** A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. **Specialists:** Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. **Testing Agency Qualifications:** An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. **Manufacturer's Representative Qualifications:** An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. **Preconstruction Testing:** Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.

- d. When testing is complete, remove test specimens, assemblies, mockups do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ABAA	Air Barrier Association of America
ABMA	American Bearing Manufacturers Association
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association (Now part of CPA)
AHAM	Association of Home Appliance Manufacturers

AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)
ALSC	American Lumber Standard Committee, Incorporated
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	Architectural Precast Association
APA	APA - The Engineered Wood Association
APA EWS	APA - The Engineered Wood Association; Engineered Wood Systems (See APA - The Engineered Wood Association)
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASCE	American Society of Civil Engineers
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International (American Society of Mechanical Engineers International)
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (American Society for Testing and Materials International)
AWCI	Association of the Wall and Ceiling Industry

AWCMA	American Window Covering Manufacturers Association (Now WCMA)
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association (Formerly: American Wood Preservers' Association)
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BICSI	BICSI, Inc.
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
BISSC	Baking Industry Sanitation Standards Committee
BWF	Badminton World Federation (Formerly: IBF - International Badminton Federation)
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Canadian Electricity Association
CEA	Consumer Electronics Association
CFFA	Chemical Fabrics & Film Association, Inc.
CGA	Compressed Gas Association
CIMA	Cellulose Insulation Manufacturers Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CRRC	Cool Roof Rating Council
CPA	Composite Panel Association
CPPA	Corrugated Polyethylene Pipe Association

CRI	Carpet and Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CSA	CSA International (Formerly: IAS - International Approval Services)
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DHI	Door and Hardware Institute
EIA	Electronic Industries Alliance
EIMA	EIFS Industry Members Association
EJCDC	Engineers Joint Contract Documents Committee
EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association (Electrostatic Discharge Association)
ETL SEMCO	Intertek ETL SEMCO (Formerly: ITS - Intertek Testing Service NA)
FIBA	Federation Internationale de Basketball (The International Basketball Federation)
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FM Approvals	FM Approvals LLC
FM Global	FM Global (Formerly: FMG - FM Global)
FMRC	Factory Mutual Research (Now FM Global)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.

FSA	Fluid Sealing Association
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Part of GSI)
GS	Green Seal
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)
HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation (Now BWF)
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IEST	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
ILI	Indiana Limestone Institute of America, Inc.
ISO	International Organization for Standardization Available from ANSI

ISSFA	International Solid Surface Fabricators Association
ITS	Intertek Testing Service NA (Now ETL SEMCO)
ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LMA	Laminating Materials Association (Now part of CPA)
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.
MFMA	Metal Framing Manufacturers Association, Inc.
MH	Material Handling (Now MHIA)
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International (National Association of Corrosion Engineers International)
NADCA	National Air Duct Cleaners Association
NAGWS	National Association for Girls and Women in Sport
NAIMA	North American Insulation Manufacturers Association
NBGQA	National Building Granite Quarries Association, Inc.
NCAA	National Collegiate Athletic Association (The)
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute

NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	NFPA (National Fire Protection Association)
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association)
NOMMA	National Ornamental & Miscellaneous Metals Association
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)
NWWDA	National Wood Window and Door Association (Now WDMA)
OPL	Omega Point Laboratories, Inc. (Now ITS)
PCI	Precast/Prestressed Concrete Institute

PDCA	Painting & Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PLANET	Professional Landcare Network (Formerly: ACLA - Associated Landscape Contractors of America)
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
SAE	SAE International
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers (See ASCE)
SGCC	Safety Glazing Certification Council
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMPTE	Society of Motion Picture and Television Engineers
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)
SPIB	Southern Pine Inspection Bureau (The)

SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TCA	Tile Council of America, Inc. (Now TCNA)
TCNA	Tile Council of North America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society
TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball
USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)

WIC Woodwork Institute of California
(Now WI)

WMMPA Wood Moulding & Millwork Producers Association

WSRCA Western States Roofing Contractors Association

WWPA Western Wood Products Association

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

IAPMO International Association of Plumbing and Mechanical Officials

ICC International Code Council

ICC-ES ICC Evaluation Service, Inc.

UBC Uniform Building Code
(See ICC)

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE Army Corps of Engineers

CPSC Consumer Product Safety Commission

DOC Department of Commerce

DOD Department of Defense

DOE Department of Energy

EPA Environmental Protection Agency

FAA Federal Aviation Administration

FCC Federal Communications Commission

FDA Food and Drug Administration

GSA General Services Administration

HUD Department of Housing and Urban Development

LBL Lawrence Berkeley National Laboratory

NCHRP National Cooperative Highway Research Program

(See TRB)

NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration
PBS	Public Buildings Service (See GSA)
PHS	Office of Public Health and Science
RUS	Rural Utilities Service (See USDA)
SD	State Department
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from U.S. Access Board
CFR	Code of Federal Regulations Available from Government Printing Office
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point
DSCC	Defense Supply Center Columbus (See FS)
FED-STD	Federal Standard (See FS)
FS	Federal Specification Available from Department of Defense Single Stock Point Available from Defense Standardization Program Available from General Services Administration

Available from National Institute of Building Sciences

FTMS Federal Test Method Standard
(See FS)

MIL (See MILSPEC)

MIL-STD (See MILSPEC)

MILSPEC Military Specification and Standards
Available from Department of Defense Single Stock Point

UFAS Uniform Federal Accessibility Standards
Available from Access Board

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CBHF State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation

CCR California Code of Regulations

CPUC California Public Utilities Commission

TFS Texas Forest Service
Forest Resource Development

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Section:
 - 1. Division 01 Section "Substitution Procedures" for requests for substitutions.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable

product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
- b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

- B. Delivery and Handling:

- 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
- 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
- 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

- C. Storage:

- 1. Store products to allow for inspection and measurement of quantity or counting of units.
- 2. Store materials in a manner that will not endanger Project structure.
- 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- 4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
- 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- 6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
 - 1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

2. **Manufacturer/Source:** Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 3. **Products:**
 - a. **Restricted List:** Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered, unless otherwise indicated.
 - b. **Nonrestricted List:** Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
 4. **Manufacturers:**
 - a. **Restricted List:** Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered, unless otherwise indicated.
 - b. **Nonrestricted List:** Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
 5. **Basis-of-Design Product:** Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. **Visual Matching Specification:** Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.
- D. **Visual Selection Specification:** Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Recycling nonhazardous demolition and construction waste.
 - 2. Disposing of nonhazardous demolition and construction waste.
- B. Related Sections:
 - 1. Division 02 Section "Selective Structure Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements, and for disposition of hazardous waste.
 - 2. Division 04 Section "Unit Masonry" for disposal requirements for masonry waste.

1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total non-hazardous solid waste generated by the Work. Facilitate recycling and salvage of materials.

1.4 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 7 days of date established for the Notice to Proceed.

1.5 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in tons.
 - 4. Quantity of waste salvaged, both estimated and actual in tons.
 - 5. Quantity of waste recycled, both estimated and actual in tons.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- C. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- D. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- E. Qualification Data: For waste management coordinator.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.6 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements of this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate

quantities by weight or volume, but use same units of measure throughout waste management plan.

- B. Waste Identification: Indicate anticipated types and quantities of demolition and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until installation.
 - 4. Protect items from damage during transport and storage.
 - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation: Not permitted on Project site.
- C. Salvaged Items for Owner's Use:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area on-site off-site designated by Owner.
 - 5. Protect items from damage during transport and storage.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 1. Pulverize concrete to maximum 1-1/2-inch (38-mm) size.
- B. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 1. Pulverize masonry to maximum 1-1/2-inch (38-mm) size.
 2. Clean and stack undamaged, whole masonry units on wood pallets.
- C. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- D. Metals: Separate metals by type.
 1. Structural Steel: Stack members according to size, type of member, and length.
 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- E. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- F. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- G. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- H. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- I. Carpet: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 1. Store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- J. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- K. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees at landfill facility.

C. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

D. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.6 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

D. Disposal: Transport waste materials and dispose of at designated spoil areas on Owner's property.

E. Disposal: Transport waste materials off Owner's property and legally dispose of them.

3.7 SAMPLE FORMS

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
- B. Related Sections:
 - 1. Division 01 Section "Photographic Documentation" for submitting final completion construction photographic documentation.
 - 2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 4. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
 - 5. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 3. Submit list of incomplete items in the following format:
 - a. PDF electronic file.
 - b. Three paper copies, unless otherwise indicated. Architect will return two copies.

1.5 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 - 4. Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.

- m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - r. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

END OF SECTION 017700

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.
- B. Pre-Demolition Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.
- C. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.4 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Pre-Demolition Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.
- E. Hazardous Materials: It is unknown whether hazardous materials will be encountered in the Work.
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.
- F. Hazardous Materials: Hazardous materials are present in construction to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- G. Storage or sale of removed items or materials on-site is not permitted.
- H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
- F. Survey of Existing Conditions: Record existing conditions by use of measured drawings and preconstruction photographs.
- G. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
- B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 5. Dispose of demolished items and materials promptly.
- B. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- C. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 042200 - CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units (CMU's).
2. Steel reinforcing bars.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For reinforcing steel. Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength.
 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

1.3 QUALITY ASSURANCE

- A. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. CMUs: ASTM C 90.
 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi.
 2. Density Classification: Normal weight.

2.2 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of Portland cement and hydrated lime containing no other ingredients.
- D. Aggregate for Mortar: ASTM C 144.
 - 1. For joints, less than 1/4-inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
- E. Aggregate for Grout: ASTM C 404.
- F. Water: Potable.

2.3 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.
- B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
 - 1. Interior Walls: Hot-dip galvanized, carbon steel.
 - 2. Exterior Walls: Hot-dip galvanized, carbon steel.
 - 3. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.

2.4 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.
 - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
 - 2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
 - 3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.5 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use masonry cement or mortar cement mortar unless otherwise indicated.

- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
 - 1. For masonry below grade or in contact with earth, use Type S.
 - 2. For reinforced masonry, use Type S.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 - 2. Proportion grout in accordance with ASTM C 476, Table 1.
 - 3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 TOLERANCES

- A. Dimensions and Locations of Elements:
 - 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
 - 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
 - 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.
- B. Lines and Levels:
 - 1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
 - 2. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
- C. Joints:
 - 1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).

3.2 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets.

Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

3.3 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
 - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Lay solid masonry units with filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.4 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
 - 1. Space reinforcement not more than 16 inches o.c.
- B. Provide continuity at corners by using prefabricated L-shaped units.

3.5 REINFORCED UNIT MASONRY INSTALLATION

- A. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.

- B. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Limit height of vertical grout pours to not more than 60 inches.

3.6 FIELD QUALITY CONTROL

- A. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.7 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

END OF SECTION 042200

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes structural steel and grout.
- B. Related Sections:
 - 1. Division 05 Section Metal Stairs and Division 13 Metal Building Systems additional requirements for architecturally exposed structural steel.

1.2 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.3 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand loads indicated and comply with other information and restrictions indicated.
 - 1. Select and complete connections using details indicated and AISC 360.
 - 2. Use LRFD; data are given at factored-load level ASD; data are given at service-load level.
- B. Moment Connections: Type PR, partially restrained.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components.
- C. Qualification Data: For qualified fabricator.
- D. Welding certificates.
- E. Mill test reports for structural steel, including chemical and physical properties.
- F. Source quality-control reports.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC 303.
 - 2. AISC 360.
 - 3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- E. Preinstallation Conference: Conduct conference at Project site.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles, M, S-Shapes: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.
- E. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
- F. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with plain finish.
- B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH, (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 490 (ASTM F 959M, Type 10.9), compressible-washer type with plain finish.
- C. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- D. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.
 1. Finish: Plain.
- E. Threaded Rods: ASTM A 36/A 36M.
 1. Finish: Plain.

2.3 PRIMER

- A. Primer: Comply with Division 09 painting Sections.
- B. Primer: SSPC-Paint 25, Type I, zinc oxide, alkyd, linseed oil primer.
- C. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.4 GROUT

- A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.
- B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
- B. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
 2. Surfaces to be field welded.
 3. Surfaces to be high-strength bolted with slip-critical connections.
 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 5. Galvanized surfaces.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 1. SSPC-SP 2, "Hand Tool Cleaning."
 2. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.8 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- C. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 1. Liquid Penetrant Inspection: ASTM E 165.
 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 3. Ultrasonic Inspection: ASTM E 164.

4. Radiographic Inspection: ASTM E 94.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedment's for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Base Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 2. Weld plate washers to top of baseplate.
 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

3.4 FIELD QUALITY CONTROL

- A. Bolted Connections: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- B. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.
- C. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

END OF SECTION 051200

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Exterior Non-Load-Bearing Wall-Framing
 - 2. Roof Trusses.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads:
 - a. Dead Loads: Weights of materials and construction 5 psf.
 - b. Live Loads: 20 psf.
 - c. Roof Loads: Secondary framing 20 psf.
 - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/240 of the wall height.
 - b. Roof sub-framing: Vertical deflection of 1/240 of the span.

1.3 SUBMITTALS

- A. Product Data: For each type of product and accessory indicated.
- B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 - 1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Welding certificates.
- D. Qualification data.
- E. Product test reports.

- F. Research/evaluation reports.

1.4 QUALITY ASSURANCE

- A. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements.
- B. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code--Sheet Steel."
- C. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- D. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."
 - 1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Truss Design."
 - 2. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."
- E. Comply with AISI's "Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two-Family Dwellings."

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

2.2 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members, unless otherwise indicated.
- B. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- C. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.
- D. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

2.3 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.
- B. Shims: Load bearing, high-density multimonomer plastic, nonleaching.

2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
 2. Flange Width: 2 inches (51 mm).
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and same minimum base-metal thickness as steel studs.
- C. Vertical Deflection Clips: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.

2.5 ROOF TRUSSES

- A. Roof Truss Members: Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched, with stiffened flanges.

2.6 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members, unless otherwise indicated.
- B. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- C. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by [hot-dip process according to ASTM A 153/A 153M, Class C.

- D. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- E. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- F. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- B. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
- C. Install framing members in one-piece lengths.
- D. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- E. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- F. Install insulation, specified in Division 07 Section "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- G. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- H. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.2 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:
 - 1. Stud Spacing: 16 inches (406 mm) of as indicated on structural drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Install single deflection tracks and anchor to building structure.
 - 2. Install double deflection tracks and anchor outer track to building structure.
 - 3. Connect vertical deflection clips to infill studs and anchor to primary building structure.
- E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
 - 1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - a. Install solid blocking at centers indicated on Shop Drawings.
 - 2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 - 3. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - 4. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable curtain-wall-framing system.

3.3 TRUSS INSTALLATION

- A. Install, bridge, and brace trusses according to Shop Drawings and requirements in this Section.
- B. Truss Spacing: 24 inches (610 mm) of as indicated on structural drawings.
- C. Do not alter, cut, or remove framing members or connections of trusses.

- D. Erect trusses with plane of truss webs plumb and parallel to each other, align, and accurately position at spacings indicated.
- E. Erect trusses without damaging framing members or connections.

3.4 SUB-FRAMING INSTALLATION

- A. Install, bridge, and brace sub-frame according to Shop Drawings and requirements in this Section.
- B. Sub-Frame Spacing: As indicated.
- C. Do not alter, cut, or remove framing members or connections of purlins.
- D. Erect sub-frame plumb and parallel to each other, align, and accurately position at spacings indicated.
- E. Erect sub-frame without damaging framing members or connections.
- F. Align load-bearing studs or continuously reinforce track to transfer loads to structure. Anchor trusses securely at all bearing points.

3.5 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 055100 - METAL STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preassembled steel stairs with concrete-filled and abrasive-coating-finished formed-metal treads.
2. Steel tube railings attached to metal stairs.
3. Steel tube handrails attached to walls adjacent to metal stairs.

B. See Division 05 Section "Pipe and Tube Railings" for pipe and tube railings not attached to metal stairs or to walls adjacent to metal stairs.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design metal stairs, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

1. Uniform Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. in. (2580 sq. mm).
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to L/240 deflection ratio or 1/4 inch (6.4 mm), whichever is less.

C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

1. Handrails and Top Rails of Guards:

- a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
- b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
- c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

- a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
- b. Infill load and other loads need not be assumed to act concurrently.

PART 2 - PRODUCTS

2.1 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Recycled Content of Steel Products: Provide products with average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
- C. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- D. Steel Tubing: ASTM A 500 (cold formed).
- E. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
- F. Steel Bars for Grating Treads: ASTM A 36/A 36M or steel strip, ASTM A 1011/A 1011M or ASTM A 1018/A 1018M.
- G. Wire Rod for Grating Crossbars: ASTM A 510 (ASTM A 510M).
- H. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
- I. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, structural steel, Grade 25 (Grade 170), unless another grade is required by design loads; exposed.
- J. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, structural steel, Grade 30 (Grade 205), unless another grade is required by design loads.

2.2 MISCELLANEOUS MATERIALS

- A. Cast-Metal Units: Cast iron, with an integral abrasive, as-cast finish.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Safety Tread Co., Inc.
 - b. Balco Inc.
 - c. Barry Pattern & Foundry Co., Inc.
 - d. Granite State Casting Co.
 - e. Safe-T-Metal Company, Inc.
 - f. Wooster Products Inc.
- B. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.

- C. Apply bituminous paint to concealed surfaces of cast-metal units set into concrete.
- D. Apply clear lacquer to concealed surfaces of extruded units set into concrete.
- E. Fasteners: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.
- F. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
- G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- H. Concrete Materials and Properties: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa) unless otherwise indicated.
- I. Welded Wire Fabric: ASTM A 185/A 185M, 6 by 6 inches (152 by 152 mm), W1.4 by W1.4, unless otherwise indicated.

2.3 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 - 1. Join components by welding unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.
 - 3. Fabricate treads and platforms of exterior stairs so finished walking surfaces slope to drain.
- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without impairing work.
- E. Weld connections to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Weld exposed corners and seams continuously unless otherwise indicated.
 - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 3 welds: partially dressed weld with spatter removed.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

- G. Fabricate joints that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.4 STEEL-FRAMED STAIRS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Alfab, Inc.
 - 2. American Stair, Inc.
 - 3. Sharon Companies Ltd. (The).
- B. Stair Framing:
 - 1. Fabricate stringers of steel plates or channels.
 - 2. Construct platforms of steel plate or channel headers and miscellaneous framing members as needed to comply with performance requirements indicated.
 - 3. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.
 - 4. Where stairs are enclosed by gypsum board shaft-wall assemblies, provide hanger rods or struts to support landings from floor construction above or below.
 - 5. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.
- C. Metal-Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements but not less than 0.067 inch (1.7 mm).
 - 1. At Contractor's option, provide stair assemblies with metal-pan subtreads filled with reinforced concrete during fabrication.
 - 2. Provide epoxy-resin-filled treads, reinforced with glass fibers, with slip-resistant, abrasive surface.
- D. Abrasive-Coating-Finished, Formed-Metal Stairs: Form risers, treads, and platforms to configurations shown from steel sheet of thickness needed to comply with performance requirements but not less than 0.097 inch (2.5 mm). Finish tread and platform surfaces with manufacturer's standard epoxy-bonded abrasive finish.
- E. Metal Floor Plate Stairs: Form treads and platforms to configurations shown from rolled-steel floor plate of thickness needed to comply with performance requirements, but not less than 1/4 inch (6.4 mm). Form treads with integral nosing and back edge stiffener. Weld steel supporting brackets to stringers and weld treads to brackets.

2.5 STAIR RAILINGS

- A. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.

1. Rails and Posts: 1-5/8-inch- (41-mm-) diameter top and bottom rails and 1-1/2-inch- (38-mm-) square posts.
 2. Picket Infill: 1/2-inch- (13-mm-) square pickets spaced less than 4 inches (100 mm) clear.
- B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 3 welds: partially dressed weld with spatter removed.
- C. Form changes in direction of railings by bending or by inserting prefabricated elbow fittings.
- D. Form curves by bending members in jigs to produce uniform curvature without buckling.
- E. Close exposed ends of railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails.
- G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.
1. Connect posts to stair framing by direct welding.
- H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, to transfer wall bracket loads through wall finishes. Size fillers to suit wall finish thicknesses.

2.6 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal stairs after assembly.
- C. Galvanizing: Hot dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
- D. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- E. Apply shop primer to uncoated surfaces of metal stair components. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- B. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
- C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints. Do not weld, cut, or abrade surfaces of exterior units that have been hot dip galvanized after fabrication.
- D. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.
- E. Place and finish concrete fill for treads and platforms to comply with Division 03 Section "Cast-in-Place Concrete."
 - 1. Install abrasive nosings with anchors fully embedded in concrete.
- F. Install precast concrete treads with adhesive supplied by manufacturer.
- G. Attach handrails to wall with wall brackets. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.

3.2 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055100

SECTION 057300 - DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum decorative railings with stainless-steel, wire-rope guard infill.

B. Related Sections:

1. Division 05 Section "Metal Stairs" for steel tube railings included with metal stairs.
2. Division 05 Section "Pipe and Tube Railings" for railings fabricated from pipe and tube components.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

- a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
- b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
- c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

- a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
- b. Infill load and other loads need not be assumed to act concurrently.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.3 SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of railings assembled from standard components.
2. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

- C. Samples: For each type of exposed finish required.
- D. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Qualification Data: For qualified professional engineer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.
- G. Preconstruction test reports.

1.4 QUALITY ASSURANCE

- A. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Aluminum Decorative Railings:
 - a. Architectural Metal Works.
 - b. Architectural Railings & Grilles, Inc.
 - c. ART Technologies, Inc.
 - d. Blum, Julius & Co., Inc.
 - e. Bluecoat of Pittsburgh.
 - f. Braun, J. G., Company; a division of the Wagner Companies.
 - g. CraneVeyor Corp.
 - h. Laurence, C. R. Co., Inc.
 - i. Livers Bronze Co.
 - j. Newman Brothers, Inc.
 - k. Pisor Industries, Inc.
 - l. Platers Polishing Company; a division of Rippel Architectural Metals.
 - m. Poma Corporation.
 - n. Sterling Dula Architectural Products, Inc.; Div. of Kane Manufacturing.
 - o. Superior Aluminum Products, Inc.
 - p. Wagner, R & B, Inc.; a division of the Wagner Companies.
 - q. Wylie Systems.

2.2 METALS, GENERAL

- A. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.3 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.
- B. Extruded Bars and Shapes, Including Extruded Tubing: ASTM B 221 (ASTM B 221M), Alloy 6063-T5/T52.
- C. Extruded Structural Pipe and Round Tubing: ASTM B 429/B 429M, Alloy 6063-T6.
- D. Drawn Seamless Tubing: ASTM B 210 (ASTM B 210M), Alloy 6063-T832.
- E. Plate and Sheet: ASTM B 209 (ASTM B 209M), Alloy 6061-T6.
- F. Die and Hand Forgings: ASTM B 247 (ASTM B 247M), Alloy 6061-T6.
- G. Castings: ASTM B 26/B 26M, Alloy A356.0-T6.

2.4 FASTENERS

- A. Fastener Materials: Unless otherwise indicated, provide the following:
 - 1. Aluminum Components: Type 304 stainless-steel fasteners.
 - 2. Stainless-Steel Components: Type 304 stainless-steel fasteners.
 - 3. Uncoated Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating where concealed; Type 304 stainless-steel fasteners where exposed.
 - 4. Galvanized-Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.
 - 5. Dissimilar Metals: Type 304 stainless-steel fasteners.
- B. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
- C. Post-Installed Anchors: Torque-controlled expansion anchors.

2.5 MISCELLANEOUS MATERIALS

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.6 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Connections: Fabricate railings with welded or nonwelded connections unless otherwise indicated.
- C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.
- D. Brazed Connections: Connect copper-alloy railings by brazing. Cope components at connections to provide close fit, or use fittings designed for this purpose. Braze corners and seams continuously.
 - 1. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and brazed surface matches contours of adjoining surfaces.
- E. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings.
- F. Form changes in direction by bending or by inserting prefabricated elbow fittings.
- G. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- H. Close exposed ends of hollow railing members with prefabricated end fittings.
- I. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
- J. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

2.7 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).

2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).
- B. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
 - C. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with grout.
 - D. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with grout.
 - E. Anchor posts to metal surfaces as indicated using fittings designed and engineered for this purpose.
 - F. Anchor railing ends to concrete and masonry with brackets on underside of rails connected to railing ends and anchored to wall construction with anchors and bolts.
 - G. Attach handrails to walls with wall brackets except where end flanges are used.
 1. Use type of bracket with predrilled hole for exposed bolt anchorage.
 2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
 - H. Secure wall brackets and railing end flanges to building construction as follows:
 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 2. For hollow masonry anchorage, use toggle bolts.
 3. For steel-framed partitions, fasten brackets directly to steel framing or concealed steel reinforcements using self-tapping screws of size and type required to support structural loads.

END OF SECTION 057300

SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Plastic-laminate cabinets.
 - 2. Plastic-laminate countertops.

1.2 SUBMITTALS

- A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1.3 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

2.2 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural woodwork, except for items specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)."
- B. Butt Hinges: 2-3/4-inch (70-mm), 5-knuckle steel hinges made from 0.095-inch- (2.4-mm-) thick metal, and as follows:
 - 1. Semi-concealed Hinges for Overlay Doors: BHMA A156.9, B01521.
- C. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.
- D. Catches: Magnetic catches, BHMA A156.9, B03141
- E. Drawer Slides: BHMA A156.9, B05091.

1. Standard Duty (Grade 1, Grade 2, and Grade 3): Side mounted; full-extension type; zinc-plated steel with polymer rollers.
- F. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
1. Satin Stainless Steel: BHMA 630.

2.3 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

2.4 FABRICATION

- A. Plastic-Laminate Cabinets: AW1 Custom Grade
1. AWI Type of Cabinet Construction: Flush overlay.
 2. Reveal Dimension: 1/2 inch (13 mm).
 3. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate as follows:
 - a. Horizontal Surfaces Other Than Tops: Grade HGS.
 - b. Vertical Surfaces: Grade HGS.
 4. Materials for Semi-Exposed Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS.
 5. Drawer Sides and Backs: Solid-hardwood lumber
 6. Drawer Bottoms: Hardwood plywood.
 7. Colors, Patterns, and Finishes: As selected by Architect from laminate manufacturer's full range of solid colors, matte finish.
- B. Plastic-Laminate Countertops: AW1 Custom Grade.
1. High-Pressure Decorative Laminate Grade: HGS.
 2. Colors, Patterns, and Finishes: As selected by Architect from laminate manufacturer's full range of solid colors, matte finish.
 3. Core Material at Sinks: exterior-grade plywood.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.

1. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c. with toggle bolts through metal backing or metal framing behind wall finish.
- B. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

END OF SECTION 064023

SECTION 071800 - TRAFFIC COATINGS

PART 1 - PRODUCTS

1.1 TRAFFIC COATING: Gallery Walking Surface.

- A. Products: Subject to compliance with requirements, provide one of the basis-of-design: Tremco, Vulkem 351.
- B. Primer: Manufacturer's standard factory-formulated primer recommended for substrate and conditions indicated.
 - 1. Material: Urethane.
- C. Preparatory and Base Coats: Single- or multicomponent, aromatic liquid urethane elastomer.
- D. Intermediate Coat: Single- or multicomponent, aromatic liquid urethane elastomer].
- E. Topcoat: Single- or multicomponent, aromatic liquid urethane elastomer with UV inhibitors.
 - 1. Color: As selected by Architect from manufacturer's full range.
- F. Component Coat Thicknesses: As recommended by manufacturer for substrate and service conditions indicated, but not less than the following (measured excluding aggregate):
 - 1. Base Coat: 25mil minimum wet film thickness.
 - 2. Topcoat: 15mil minimum wet film thickness.
- G. Aggregate: Uniformly graded, washed silica sand of particle sizes, shape, and minimum hardness recommended in writing by traffic coating manufacturer.
 - 1. Spreading Rate: As recommended by manufacturer for substrate and service conditions indicated:

PART 2 - EXECUTION

2.1 PREPARATION

- A. Clean and prepare substrates according to ASTM C 1127 and manufacturer's written recommendations to produce clean, dust-free, dry substrate for traffic coating application.
- B. Concrete Substrates: Mechanically abrade concrete surfaces to a uniform profile according to ASTM D 4259. Do not acid etch.
 - 1. Remove grease, oil, paints, and other penetrating contaminants from concrete.
 - 2. Remove concrete fins, ridges, and other projections.

3. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form-release agents, and other incompatible materials that might affect coating adhesion.
4. Remove remaining loose material to provide a sound surface, and clean surfaces according to ASTM D 4258.

2.2 JOINT AND CRACK TREATMENT

- A. Prepare, treat, rout, and fill joints and cracks in substrates according to ASTM C 1127 and manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.

2.3 TRAFFIC COATING APPLICATION

- A. Apply traffic coating material according to ASTM C 1127 and manufacturer's written recommendations.

2.4 PROTECTING AND CLEANING

END OF SECTION 071800

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass-fiber blanket insulation.
 - 2. Vapor retarders.
 - 3. Closed-Cell Polyurethane Spray Foam.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product test reports.
- C. Research/evaluation reports.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET INSULATION

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. CertainTeed Corporation.
 - 2. Guardian Building Products, Inc.
 - 3. Johns Manville.
 - 4. Knauf Insulation.
 - 5. Owens Corning.
- B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
- C. Polypropylene-Scrim-Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).
- D. Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

- E. Reinforced-Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.
- F. Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.
- G. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

2.2 VAPOR RETARDERS

- A. Polyethylene Vapor Retarders: ASTM D 4397, 6 mils (0.15 mm) thick, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.3 SPRAY FOAM

- A. Spray applied rigid cellular polyurethane thermal insulation ASTM C1029.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.2 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

- B. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 4. Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
 5. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
 6. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
 - a. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members.
 - b. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
- C. Spray-Applied Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.
- D. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
1. Loose-Fill Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.3 INSTALLATION OF VAPOR RETARDERS

- A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.
1. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches (406 mm) o.c.
 2. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings.

Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.

3. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.
- C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

END OF SECTION 072100

SECTION 075416 - ETHYLENE INTERPOLYMER (KEE) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered KEE membrane roofing system.

1.2 PERFORMANCE REQUIREMENTS

- A. Energy Performance: Provide roofing system that is listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.
- B. All roofing materials shall be Class 'A' per ASTM E 108 and shall be certified by a nationally recognized, independent testing laboratory.
- C. Roofing materials shall resist wind up-lift forces per ASCE 7-10 and design wind speeds per structural drawings.
- D. Roof membrane shall be inspected by the manufacturer's representative within one (1) year of acceptance by DSC.
- E. Contractor shall provide Architect with "Final Statement of Compliance" which states that the roof membrane complies with the approved contract documents.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
- C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 1. Submit evidence of compliance with performance requirements.
- D. Maintenance data.
- E. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product.
- F. Pre-installation Roofing Conference: Conduct conference at Project site.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 KEE MEMBRANE ROOFING

- A. KEE Sheet: ASTM D 6754, fabric reinforced, and fabric backed.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Versico; by Carlisle.
 - b. Ecology Roof Systems.
 - c. Flex Membranes International, Inc.
 - d. Seaman Corporation.
 - e. Tremco Incorporated.
 - 2. Thickness: 45 mils nominal.
 - 3. Exposed Face Color: White.

2.2 AUXILIARY MEMBRANE ROOFING MATERIALS

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as KEE sheet membrane.
- C. Bonding Adhesive: Manufacturer's standard, water based.
- D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.

- F. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.3 ROOF INSULATION

- A. Composite Polyisocyanurate Board Insulation: ASTM C 1289, with factory-applied facing board on one major surface, as indicated below by type, and felt or glass-fiber mat facer on the other.
 - 1. Type IV, cellulosic-fiber-insulating-board facer, Grade 2, 2 inch (13 mm) thick minimum.

2.4 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- B. Insulation Adhesive: Insulation manufacturer's recommended cold-applied adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- C. Cover Board: ASTM C 208, Type II, Grade 2, cellulosic-fiber insulation board, 1/2 inch (13 mm) thick.

PART 3 - EXECUTION

3.1 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
- D. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 - 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

3.2 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
- B. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.
- D. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing. All new installed materials shall be sealed against moisture intrusion at the end of the day.
- E. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- F. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
 - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.

3.3 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

END OF SECTION 075416

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured reglets and counterflashing.
2. Formed roof drainage sheet metal fabrications.
3. Formed steep-slope roof sheet metal fabrications.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.

1. Include details for forming, joining, supporting, and securing sheet metal flashing and trim, including pattern of seams, termination points, fixed points, expansion joints, expansion-joint covers, edge conditions, special conditions, and connections to adjoining work.

C. Samples: For each exposed product and for each finish specified.

D. Maintenance data.

E. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

B. Pre-installation Conference: Conduct conference at Project site.

1.4 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed; 2D (dull, cold rolled) finish.

2.2 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 40 mils (1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
 - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C).

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 - 2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

- D. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
 - 1. Obtain field measurements for accurate fit before shop fabrication.
 - 2. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.
- C. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections.

Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

- B. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Fabricate from the following materials:
 - a. Steel: 24 gauge (0.70 mm) thick.
- C. Valley Flashing: Fabricate from the following materials:
 - 1. Steel: 24 gauge (0.70 mm) thick.
- D. Drip Edges: Fabricate from the following materials:
 - 1. Steel: 24 gauge (0.70 mm) thick.
- E. Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials:
 - 1. Steel: 24 gauge (0.70 mm) thick.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement so that completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
 5. Install sealant tape where indicated.
 6. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
1. Coat back side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal joints as shown and as required for watertight construction.
- F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
 2. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored straps spaced not more than 36 inches (900 mm) apart. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m) apart. Install expansion-joint caps.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
- D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches (100 mm) in direction of water flow.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75-mm) centers.
- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with sealant.
- E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric butyl sealant and clamp flashing to pipes that penetrate roof.

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.6 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.

- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 076200

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof curbs.
 - 2. Equipment supports.
 - 3. Roof hatches.

1.2 SUBMITTALS

- A. Product Data: For each type of roof accessory indicated.
- B. Shop Drawings: For roof accessories.
- C. Samples: For each exposed product and for each color and texture specified.
- D. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items.
- E. Operation and maintenance data.
- F. Warranty: Sample of special warranty.

1.3 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.
 - 1. Mill-Phosphatized Finish: Manufacturer's standard for field painting.
 - 2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil (0.005 mm).

2.2 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Acrylic Glazing: ASTM D 4802, thermoformable, monolithic sheet, manufacturer's standard,
- C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.
- D. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.
- E. Sealants: As recommended by roof accessory manufacturer for installation indicated.

2.3 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints, stepped integral metal cant raised the thickness of roof insulation, and integrally formed deck-mounting flange at perimeter bottom.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following.
 - a. AES Industries, Inc.
 - b. Curbs Plus, Inc.
 - c. Custom Solution Roof and Metal Products.
 - d. Greenheck Fan Corporation.
 - e. LM Curbs.
 - f. Metallic Products Corp.
 - g. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
 - h. Pate Company (The).
 - i. Roof Products, Inc.
 - j. Safe Air of Illinois.
 - k. Thybar Corporation.
 - l. Vent Products Co., Inc.
- B. Material: Zinc-coated (galvanized) steel sheet, 0.052 inch (1.32 mm) thick.
 - 1. Finish: Factory prime coating.
 - 2. Color: As selected by Architect from manufacturer's full range.
- C. Construction:
 - 1. Insulation: Factory insulated with 1-1/2-inch- (38-mm-) thick glass-fiber board insulation.

2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
3. Factory-installed wood nailer at top of curb, continuous around curb perimeter.
4. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
5. Fabricate curbs to minimum height of 12 inches (300 mm) unless otherwise indicated.
6. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.
7. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
8. Security Grille: Provide where indicated.

2.4 ROOF HATCH

- A. Roof Hatches: Metal roof-hatch units with lids and insulated double-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, and integrally formed deck-mounting flange at perimeter bottom.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. AES Industries, Inc.
 - b. Babcock-Davis.
 - c. Bilco Company (The).
 - d. Bristolite Skylights.
 - e. Custom Solution Roof and Metal Products.
 - f. Dur-Red Products.
 - g. Hi Pro International, Inc.
 - h. J. L. Industries, Inc.
 - i. Metallic Products Corp.
 - j. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
 - k. Naturalite Skylight Systems; Vistawall Group (The).
 - l. Nystrom.
 - m. O'Keeffe's Inc.
 - n. Pate Company (The).
 - o. Precision Ladders, LLC.
- B. Type and Size: Single-leaf lid, 30 by 36 inches (750 by 900 mm).
- C. Loads: Minimum 40-lbf/sq. ft. (1.9-kPa) external live load and 20-lbf/sq. ft. (0.95-kPa) internal uplift load.
- D. Hatch Material: Zinc-coated (galvanized) steel sheet, 0.079 inch (2.01 mm) thick.
 1. Finish: Factory prime coating.
 2. Color: As selected by Architect from manufacturer's full range.
- E. Construction:

1. Insulation: Polyisocyanurate board.
 2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
 3. Hatch Lid: Glazed, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
 4. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
 5. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
 6. Fabricate curbs to minimum height of 12 inches (300 mm) unless otherwise indicated.
- F. Hardware: Galvanized-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
1. Provide two-point latch on lids larger than 84 inches (2130 mm).
 2. Provide remote-control operation.
- G. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.
- H. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder. Post locks in place on full extension; release mechanism returns post to closed position.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.
1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
1. Coat concealed side of roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene sheet.

- C. Seal joints with sealant as required by roof accessory manufacturer.

3.2 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Division 09 painting Sections.
- C. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.

1.2 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Warranties.

1.3 QUALITY ASSURANCE

1.4 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
 1. Architectural Sealants: 250 g/L.
 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 3. Sealant Primers for Porous Substrates: 775 g/L.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing

according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

2.2 SILICONE JOINT SEALANTS

A. Mildew-Resistant Neutral-Curing Silicone Joint Sealant: ASTM C 920.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Building Systems.
 - b. Dow Corning Corporation.
 - c. GE Advanced Materials - Silicones.
 - d. May National Associates, Inc.
 - e. Pecora Corporation.
 - f. Polymeric Systems, Inc.
 - g. Schnee-Morehead, Inc.
 - h. Sika Corporation; Construction Products Division.
 - i. Tremco Incorporated.
2. Type: Single component (S).
3. Grade: Pourable (P) or non-sag (NS).
4. Class: 100/50.
5. Uses Related to Exposure: Traffic (T) or Non-traffic (NT).

2.3 JOINT SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.4 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Non-Sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form

smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Other joints as indicated.
 2. Joint Sealant: Silicone.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal non-traffic surfaces.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints in exterior insulation and finish systems.
 - d. Perimeter joints between materials listed above and frames of doors and louvers.
 2. Joint Sealant: Silicone.
- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 2. Joint Sealant: Silicone.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces.
1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Vertical joints on exposed surfaces of interior unit masonry walls and partitions.
 - d. Perimeter joints between interior wall surfaces and frames of interior doors.
 2. Joint Sealant: Silicone.

E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.

1. Joint Sealant Location:

a. Joints between plumbing fixtures and adjoining walls, floors, and counters.

2. Joint Sealant: Silicone.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard hollow metal doors and frames.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.

1.3 QUALITY ASSURANCE

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Amweld Building Products, LLC.
2. Benchmark; a division of Therma-Tru Corporation.
3. Ceco Door Products; an Assa Abloy Group company.
4. Curries Company; an Assa Abloy Group company.
5. Deansteel Manufacturing Company, Inc.
6. Firedoor Corporation.
7. Fleming Door Products Ltd.; an Assa Abloy Group company.
8. Habersham Metal Products Company.
9. Kewanee Corporation (The).
10. Mesker Door Inc.
11. Pioneer Industries, Inc.
12. Security Metal Products Corp.
13. Steelcraft; an Ingersoll-Rand company.
14. Windsor Republic Doors.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS, Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS, Type B.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) metallic coating.
- D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- G. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat.

2.3 STANDARD HOLLOW METAL DOORS

- A. General: Comply with ANSI/SDI A250.8.
 - 1. Design: Flush panel.
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.
 - 3. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- (1.0-mm-) thick, end closures or channels of same material as face sheets.
 - 4. Tolerances: SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. All Doors: Face sheets fabricated from metallic-coated steel sheet. Comply with ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
 - 1. Level 2 and Physical Performance Level B (Heavy Duty), Model 1 (Full Flush).
- C. Hardware Reinforcement: ANSI/SDI A250.6.

2.4 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8.

- B. All Frames: Fabricated from metallic-coated steel sheet.
 - 1. Fabricate frames with mitered or coped corners.
 - 2. Fabricate frames as face welded unless otherwise indicated.
 - 3. Frames for Level 2 Steel Doors: 0.053-inch- (1.3-mm-) thick steel sheet.
- C. Hardware Reinforcement: ANSI/SDI A250.6.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
 - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
 - 3. Floor Anchors: Formed From same materials as frames, not less than 0.042 inch (1.0 mm) thick. Monolithic Concrete Slabs: Chip-type anchors, with two holes to receive fasteners.
 - 4. Post installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

2.6 LOUVERS

- A. Provide sight proof louvers for, where indicated, that comply with SDI 111C, with blades or baffles formed of 0.020-inch- (0.5-mm-) thick, cold-rolled steel sheet set into 0.032-inch- (0.8-mm-) thick steel frame.

2.7 FABRICATION

- A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
- B. Hollow Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors. Seal joints in top edges of doors against water penetration.
- C. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 3. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - b. Post installed Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
 4. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers.
 - a. Single-Door Frames: Three door silencers.
- D. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce doors and frames to receive non-templated, mortised and surface-mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

2.8 STEEL FINISHES

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
 1. Shop Primer: ANSI/SDI A250.10.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hollow Metal Frames: Comply with ANSI/SDI A250.11.
 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - b. Install frames with removable glazing stops located on secure side of opening.
 - c. Install door silencers in frames before grouting.

- d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - f. Field apply bituminous coating to backs of frames that are filled with grout containing anti-freezing agents.
- 2. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
- 3. In-Place Concrete or Masonry Construction: Secure frames in place with post installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
- 4. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus, or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- B. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
 - b. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
 - c. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).

3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- C. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with hardboard.

B. Related Sections:

1. Division 08 Section "Glazing" for glass view panels in flush wood doors.

1.2 SUBMITTALS

A. Product Data: For each type of door indicated.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.
3. Indicate requirements for veneer matching.
4. Indicate doors to be factory finished and finish requirements.
5. Indicate fire-protection ratings for fire-rated doors.

1.3 QUALITY ASSURANCE

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Algoma Hardwoods, Inc.

2. Ampco, Inc.
3. Buell Door Company Inc.
4. Chappell Door Co.
5. Eagle Plywood & Door Manufacturing, Inc.
6. Eggers Industries.
7. Lambton Doors.
8. Marlite.
9. Mohawk Flush Doors, Inc.; a Masonite company.
10. VT Industries Inc.

2.2 DOOR CONSTRUCTION, GENERAL

- A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.
- B. WDMA I.S.1-A Performance Grade:
 1. Heavy Duty unless otherwise indicated.
- C. Particleboard-Core Doors:
 1. Particleboard: ANSI A208.1, Grade LD-1, made with binder containing no urea-formaldehyde resin.
 2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
- D. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
 1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.

2.3 VENEERED-FACED DOORS FOR TRANSPARENT FINISH

- A. Interior Solid-Core Doors:
 1. Grade: Custom (Grade A faces).
 2. Species: White oak.
 3. Cut: Plain sliced (flat sliced).
 4. Match between Veneer Leaves: Pleasing match.
 5. Assembly of Veneer Leaves on Door Faces: Running match.
 6. Core: Particleboard.
 7. Construction: Five or seven plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering.
 8. Construction: Seven plies, either bonded or nonbonded construction.

2.4 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 - 1. Comply with requirements in NFPA 80 for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied.
- C. Openings: Cut and trim openings through doors in factory.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hardware: For installation, see Division 08 Section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
 - a. Comply with NFPA 80 for fire-rated doors.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION 081416

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Service doors.
2. Counter doors.

B. Related Section:

1. Division 05 Section "Metal Fabrications" for miscellaneous steel supports.

1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance, Exterior Doors: Exterior overhead coiling doors shall withstand the wind loads, the effects of gravity loads, and loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.

1. Wind Loads: As indicated on Drawings.

B. Windborne-Debris-Impact-Resistance Performance: Provide impact-protective overhead coiling doors that pass missile-impact and cyclic-pressure tests when tested according to ASTM E 1886 and ASTM E 1996.

1. Large Missile Test: For overhead coiling doors located within 30 feet (9.144 m) of grade.

1.3 SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Show locations of replaceable fusible links.

C. Maintenance Data.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

PART 2 - PRODUCTS

2.1 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated.
- B. Bottom Bar for Service Doors: Consisting of two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch (38 by 38 by 3 mm) thick; fabricated from metal to match curtain slats and finish.
- C. Bottom Bar for Counter Doors: Manufacturer's standard continuous channel or tubular shape, fabricated from metal to match curtain slats and finish.
- D. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.2 HOOD

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
 - 1. Include automatic drop baffle on fire-rated doors to guard against passage of smoke or flame.

2.3 COUNTER DOORS

- A. Integral Frame, Hood, and Fascia for Counter Door: Welded sheet metal assembly of the following sheet metal: Galvanized Steel.
- B. Integral Metal Sill for Counter Door: Fabricate sills as integral part of frame assembly of Type 304 stainless steel in manufacturer's standard thickness with No. 4 finish.

2.4 LOCKING DEVICES

- A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

2.5 CURTAIN ACCESSORIES

- A. Weatherseals: Equip each exterior door with weather-stripping gaskets fitted to entire perimeter of door for a weathertight installation, unless otherwise indicated.
- B. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door. Provide pull-down straps or pole hooks for doors more than 84 inches (2130 mm) high.

2.6 MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.7 MANUAL DOOR OPERATORS

- A. Equip door with manufacturer's recommended manual door operator unless another type of door operator is indicated.
- B. Push-up Door Operation: Design counterbalance mechanism so required lift or pull for door operation does not exceed 25 lbf (111 N).
- C. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum 25 lbf (111 N) force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.

2.8 DOOR ASSEMBLY

- A. Service Door: Overhead coiling door formed with curtain of interlocking metal slats.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ACME Rolling Doors.
 - b. Alpine Overhead Doors, Inc.
 - c. AlumaTek, Inc.
 - d. C.H.I. Overhead Doors.

- e. City-Gates.
- f. Cookson Company.
- g. Cornell Iron Works, Inc.
- h. Dynamic Closures Corp.
- i. Lawrence Roll-Up Doors, Inc.
- j. Mahon Door Corporation.
- k. McKeon Rolling Steel Door Company, Inc.
- l. Metro Door.
- m. Overhead Door Corporation.
- n. QMI Security Solutions.
- o. Raynor.
- p. Southwestern Steel Rolling Door Co.
- q. Wayne-Dalton Corp.
- r. Windsor Door.

- B. Operation Cycles: Not less than 10,000.
- C. Door Curtain Material: Galvanized steel.
- D. Door Curtain Slats: Flat profile slats of 1-1/4-inch (32-mm) center-to-center height.
- E. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats.
- F. Hood: Match curtain material and finish.
 - 1. Shape: Square.
 - 2. Mounting: Face of wall.
- G. Sill Configuration for Counter Door: No sill.
- H. Locking Devices: Equip door with slide bolt for padlock.
- I. Manual Door Operator: Push-up operation.
 - 1. Provide operator with manufacturer's standard removable operating arm.
- J. Door Finish:
 - 1. Factory Prime Finish: Manufacturer's standard color.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

- B. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion. Lubricate bearings and sliding parts as recommended by manufacturer. Adjust seals to provide weathertight fit around entire perimeter.

3.2 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 083323

SECTION 083513 - FOLDING DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Accordion folding doors.
 - 2. Bifold doors.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, attachments to other work.
- C. Samples: For each exposed product and for each color and texture specified.
- D. Product Schedule: For folding doors. Use same designations indicated on Drawings.
- E. Product certificates.
- F. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 50 or less.

PART 2 - PRODUCTS

2.1 ACCORDION FOLDING DOORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Curtition, Inc.
 - 2. FolDoor; Holcomb & Hoke Mfg. Co., Inc.
 - 3. Hufcor, Inc.
 - 4. KWIK-WALL Company.

5. Moderco Inc.
 6. Modernfold, Inc; a DORMA Group company.
 7. Panelfold Inc.
- B. General: Top-supported, horizontal-sliding, manually operated accordion folding doors, with chain controlling the spacing and extension of pantographic or X-type accordion folding frames. Inner and outer covers are continuous surface facings that attach to and completely cover the folding frames and are pleated as the door is retracted.
- C. Outer Covering: Complying with indicated surface-burning characteristics; attached to door support frames in a concealed manner at sufficient intervals to prevent sagging and separation and to permit on-site removal and repair, with vertical seams located in valleys and material hemmed at top and bottom.
1. Vinyl reinforced with woven backing weighing not less than 20 oz./linear yd. (567 g/m).
 - a. Color, Texture, and Pattern: As selected by Architect from manufacturer's full range.
- D. Sweep Seals: Manufacturer's standard top and bottom sweep seals on both sides.
- E. Carriers: Four-wheel carriers at lead post and two-wheel carriers at intermediate spacing, as necessary for size and weight of partition, to ensure secure, easy, and quiet operation.
1. Doors 96 Inches (2438 mm) High or Less: Nylon wheels on steel shafts.
 2. Doors More Than 96 Inches (2438 mm) High: Ball-bearing wheels with nylon tread and steel shafts.
- F. Tracks: Manufacturer's standard metal track made of extruded aluminum or formed steel with factory-applied, corrosion-resistant finish. Limit track deflection, independent of structural supporting system, to no more than 80 percent of bottom clearance.
1. Head Trim: Prefinished wood molding for surface-mounted tracks.
 2. Center stop for center-opening partitions.
 3. Galvanized-steel sheet or aluminum subchannel for forming pocket for recessed suspension track.
 4. Metal ceiling contact guard to protect finished ceiling surface from damage by moving top sweep seals; with finish matching other exposed metal.
 5. Curved track sections with ceiling clips to accommodate configuration indicated.
 6. Glide switch to divert door to auxiliary track.
 7. Pivot switch to change track direction.
 8. Cross-track switch to allow one door to cross another.
- G. Hardware: Manufacturer's standard heavy-duty, manually operated metal pulls and latches as follows:
1. Finish: Clear-anodized aluminum.
 2. Latch: Operable from both sides of closed door with coin-slot release on opposite side.
 3. Lock: Manufacturer's standard key-operated cylinder lock, operable from both sides.

- H. Jamb Molding: Manufacturer's standard wood or metal molding at closing jamb as required for light-tight jamb closure.
- I. Lead Posts and Jamb Posts: Not less than 0.048-inch- (1.2-mm-) thick extruded aluminum, formed for rigidity and light seal at supporting construction.
 - 1. Nonferrous jamb strip for single-operating partitions to ensure tight closure by engaging rubber bumper on lead post.
- J. Meeting Post: Fixed single jamb for single-stacked doors.
- K. Stacking: Tiebacks to maintain door in stacked position.
- L. Stacking Configuration: Stack single doors at one end of opening.
- M. Opening Size: As indicated on Drawings.

2.2 BIFOLD DOORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Dunbarton Corporation; Slimfold Products Division.
- B. General: Metal folding doors hinged together in pairs and supported on pivots at jamb, with floor and overhead track and door guide pins.
- C. Metal Panels: Sizes as indicated, formed from nominal 0.024-inch- (0.6-mm-) thick, cold-rolled steel sheet. Channel form vertical edges and weld cross bracing to panel and channel-formed edges.
 - 1. Surface Profile: Flush.
 - 2. Configuration: Two-panel bifold.
 - 3. Sheet Metal Texture: Smooth.
 - 4. Protective Finish: Hot-dip galvanized coating applied to panels, stiffeners, hinges, and decorative trim.
 - 5. Baked Finish: Baked-enamel factory finish in white.
- D. Hardware: Manufacturer's standard felt pads, screws, and pulls in standard finish. Hinges, pivots, and manufacturer's standard wheels factory installed and as follows:
 - 1. Hinges: 3 self-aligning hinges.
 - 2. Guides and Pivots: Not less than 5/16-inch- (7.9-mm-) diameter, adjustable screw-type, weight-bearing, zinc-plated pivot rod held in place by nylon rod clamp assemblies; with not less than 1/4-inch- (6.4-mm-) diameter, spring-loaded, self-aligning, zinc-plated steel guide rods and top pivot rods held in place by nylon sleeves.
 - 3. Track: Prefinished rolled steel with baked-enamel paint finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install folding doors complying with manufacturer's written installation instructions. Install track in one piece.
- B. Standard Floor Clearances: 1/4 to 3/4 inch (6.4 to 19 mm) maximum (above floor finish).
- C. Adjust units as necessary to ensure smooth, quiet operation without warping or binding. Adjust hardware to function smoothly. Confirm that latches engage accurately and securely without forcing or binding.

END OF SECTION 083513

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior storefront framing.
2. Storefront framing for punched openings.
3. Exterior manual-swing entrance doors and door frame units.

1.2 PERFORMANCE REQUIREMENTS

A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:

1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
2. Dimensional tolerances of building frame and other adjacent construction.
3. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferring to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
 - d. Noise or vibration created by wind and by thermal and structural movements.
 - e. Loosening or weakening of fasteners, attachments, and other components.
 - f. Failure of operating units.

B. Deflection of Framing Members:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane shall not exceed $L/175$ of the glass edge length for each individual glazing lite $1/175$ of clear span for spans up to 13 feet 6 inches (4.1 m) and to $1/240$ of clear span plus $1/4$ inch (6.35 mm) for spans greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to $3/4$ inch (19 mm), whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to $L/360$ of clear span or $1/8$ inch (3.2 mm), whichever is smaller amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components directly below them to less than $1/8$ inch (3.2 mm) and clearance between members and operable units directly below them to less than $1/16$ inch (1.5 mm).

- C. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa).
- D. Water Penetration under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.
- C. Samples: For each type of exposed finish required.
- D. Other Action Submittals:
 - 1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.
- E. Maintenance data.
- F. Warranties: Sample of special warranties.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
- C. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and Florida Building Code.
- D. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.

- E. Preinstallation Conference: Conduct conference at Project site.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes do not comply with requirements or that fail in materials or workmanship within specified warranty period. Warranty does not include normal weathering.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Arcadia, Inc.
 - 2. Arch Aluminum & Glass Co., Inc.
 - 3. CMI Architectural.
 - 4. Commercial Architectural Products, Inc.
 - 5. EFCO Corporation.
 - 6. Kawneer North America; an Alcoa company.
 - 7. Leed Himmel Industries, Inc.
 - 8. Pittco Architectural Metals, Inc.
 - 9. TRACO.
 - 10. Tubelite.
 - 11. United States Aluminum.
 - 12. Vistawall Architectural Products; The Vistawall Group; a Bluescope Steel company.
 - 13. YKK AP America Inc.

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 - 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 - 3. Extruded Structural Pipe and Tubes: ASTM B 429.
 - 4. Structural Profiles: ASTM B 308/B 308M.
 - 5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

- B. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer, complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
 - 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - 2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 - 3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.3 FRAMING SYSTEMS

- A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - 1. Construction: Nonthermal.
 - 2. Glazing System: Retained mechanically with gaskets on four sides.
 - 3. Glazing Plane: Center.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts, complying with ASTM A 123/A 123M or ASTM A 153/A 153M.
- E. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.

2.4 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
 - 1. Door Construction: 1-3/4-inch (44.5-mm) overall thickness, with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
 - 2. Door Design: Medium stile; 3-1/2-inch (88.9-mm) nominal width.
 - a. Accessible Doors: Smooth surfaced for width of door in area within 10 inches (255 mm) above floor or ground plane.

3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
 - a. Provide nonremovable glazing stops on outside of door.
- B. Entrance Door Hardware: As specified in Division 08 Section "Door Hardware."

2.5 ENTRANCE DOOR HARDWARE

- A. General: Provide entrance door hardware for each entrance door to comply with requirements in this Section.
 1. Opening-Force Requirements:
 - a. Egress Doors: Not more than 15 lbf (67 N) to release the latch and not more than 30 lbf (133 N) to set the door in motion and not more than 15 lbf (67 N) to open the door to its minimum required width.
 - b. Accessible Interior Doors: Not more than 5 lbf (22.2 N) to fully open door.
- B. Opening-Force Requirements:
 1. Latches and Exit Devices: Not more than 15 lbf (67 N) required to release latch.
- C. Pivot Hinges: BHMA A156.4, Grade 1.
 1. Offset-Pivot Hinges: Provide top, bottom, and intermediate offset pivots at each door leaf.
- D. Automatic and Self-Latching Flush Bolts: BHMA A156.3, Grade 1.
- E. Cylinders: As specified in Division 08 Section "Door Hardware."
- F. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.
- G. Operating Trim: BHMA A156.6.
- H. Closers: BHMA A156.4, Grade 1, with accessories required for a complete installation, sized as required by door size, exposure to weather, and anticipated frequency of use; adjustable to meet field conditions and requirements for opening force.
- I. Door Stops: BHMA A156.16, Grade 1, floor or wall mounted, as appropriate for door location indicated, with integral rubber bumper.
- J. Weather Stripping: Manufacturer's standard replaceable components.
- K. Thresholds: BHMA A156.21, raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch (13 mm).

2.6 ACCESSORY MATERIALS

- A. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil (0.762-mm) thickness per coat.

2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 6. Provisions for field replacement of glazing from interior.
 - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, or thicker.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
6. Seal joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

D. Set continuous sill members and flashing in full sealant bed as specified in Division 07 Section "Joint Sealants" to produce weathertight installation.

E. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

F. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.2 FIELD QUALITY CONTROL

A. Repair or remove work if test results and inspections indicate that it does not comply with specified requirements.

B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Aluminum-framed assemblies will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 084113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Commercial door hardware.
 - 2. Cylinders for doors specified in other Sections.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Details of electrified door hardware, including wiring diagrams.
- C. Other Action Submittals:
 - 1. Door Hardware Sets: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as procedures and diagrams.
 - a. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
 - b. Content: Include the following information:
 - 1) Identification number, location, hand, fire rating, and material of each door and frame.
 - 2) Type, style, function, size, quantity, and finish of each door hardware item. Include description and function of each lockset and exit device.
 - 3) Complete designations of every item required for each door or opening including name and manufacturer.
 - 4) Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by lock manufacturer.
 - 1. Installer's responsibilities include supplying and installing door hardware and providing a qualified Architectural Hardware Consultant available during the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

- B. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.5 COORDINATION

- A. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Three years from date of Substantial Completion, except as follows:
 - a. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in this Section and door hardware sets indicated in door and frame schedule.
 - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Sets" Article. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Sets" Article.
 - 2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

2.2 HINGES, GENERAL

- A. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- B. Hinge Base Metal: Unless otherwise indicated, provide the following:
 - 1. Exterior Hinges: Stainless steel, with stainless-steel pin.

- C. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for outswinging exterior doors.
- D. Fasteners: Comply with the following:
 - 1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.

2.3 HINGES

- A. Butts and Hinges: BHMA A156.1.
- B. Template Hinge Dimensions: BHMA A156.7.
- C. Available Manufacturers:
 - 1. Baldwin Hardware Corporation (BH).
 - 2. Bommer Industries, Inc. (BI).
 - 3. Cal-Royal Products, Inc. (CRP).
 - 4. Hager Companies (HAG).
 - 5. Lawrence Brothers, Inc. (LB).
 - 6. McKinney Products Company; an ASSA ABLOY Group company (MCK).
 - 7. PBB, Inc. (PBB).
 - 8. Stanley Commercial Hardware; Div. of The Stanley Works (STH).

2.4 LOCKS AND LATCHES, GENERAL

- A. Accessibility Requirements: Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22 N).
- B. Lock Trim:
 - 1. Levers: Schlage ND Tubular or similar.
 - 2. Dummy Trim: Match lever lock trim and escutcheons.
- C. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors.
- D. Backset: 2-3/4 inches (70 mm), unless otherwise indicated.
- E. Strikes: Manufacturer's standard strike with strike box for each latch bolt or lock bolt, with curved lip extended to protect frame, finished to match door hardware set.

2.5 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: Function numbers and descriptions indicated in door hardware sets comply with the following:
 - 1. Bored Locks: BHMA A156.2.

B. Bored Locks: BHMA A156.2, Grade 1; Series 4000.

1. Available Manufacturers:

- a. Arrow USA; an ASSA ABLOY Group company (ARW).
- b. Best Access Systems; Div. of The Stanley Works (BAS).
- c. Cal-Royal Products, Inc. (CRP).
- d. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (CR).
- e. Falcon Lock; an Ingersoll-Rand Company (FAL).
- f. Marks USA (MKS).
- g. Medeco Security Locks, Inc.; an ASSA ABLOY Group company (MED).
- h. PDQ Manufacturing (PDQ).
- i. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SGT).
- j. Schlage Commercial Lock Division; an Ingersoll-Rand Company (SCH).
- k. Security Door Controls (SDC).
- l. Weiser Lock; a Masco Company (WEI).
- m. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

2.6 AUXILIARY LOCKS AND LATCHES

A. Auxiliary Locks: BHMA A156.5, Grade 1.

1. Available Manufacturers:

- a. ABLOY Security, Inc.; an ASSA ABLOY Group company (ABL).
- b. Accurate Lock & Hardware Co. (ALH).
- c. Adams Rite Manufacturing Co. (ARM).
- d. Arrow USA; an ASSA ABLOY Group company (ARW).
- e. Best Access Systems; Div. of The Stanley Works (BAS).
- f. Cal-Royal Products, Inc. (CRP).
- g. Falcon Lock; an Ingersoll-Rand Company (FAL).
- h. Marks USA (MKS).
- i. Medeco Security Locks, Inc.; an ASSA ABLOY Group company (MED).
- j. PDQ Manufacturing (PDQ).
- k. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SGT).
- l. Schlage Commercial Lock Division; an Ingersoll-Rand Company (SCH).
- m. Weiser Lock; a Masco Company (WEI).
- n. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

2.7 DOOR BOLTS

A. Bolt Throw: Comply with testing requirements for length of bolts required for labeled fire doors.

B. Dustproof Strikes: BHMA A156.16, Grade 1.

2.8 LOCK CYLINDERS

- A. Standard Lock Cylinders: BHMA A156.5, Grade 1.
- B. Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
 - 1. Number of Pins: Five.
- C. Permanent Cores: Manufacturer's standard; finish face to match lockset; with interchangeable cores.
- D. Construction Keying: Comply with the following:
 - 1. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.
 - 2. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.
 - a. Furnish permanent cores to Owner for installation.
- E. Manufacturer: Same manufacturer as for locks and latches.

2.9 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference into master key system.

2.10 OPERATING TRIM

- A. Standard: BHMA A156.6.
- B. Materials: Fabricate from stainless steel, unless otherwise indicated.
- C. Available Manufacturers:
 - 1. Burns Manufacturing Incorporated (BM).
 - 2. Forms + Surfaces (FS).
 - 3. Hager Companies (HAG).
 - 4. Hiawatha, Inc. (HIA).
 - 5. IVES Hardware; an Ingersoll-Rand Company (IVS).
 - 6. Rockwood Manufacturing Company (RM).
 - 7. Trimco (TBM).

2.11 CLOSERS

- A. Accessibility Requirements: Comply with the following maximum opening-force requirements:
 - 1. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.

- B. Door Closers for Means of Egress Doors: Comply with NFPA 101. Door closers shall not require more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.
- C. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
- D. Surface Closers: BHMA A156.4, Grade 1. Provide type of arm required for closer to be located on non-public side of door, unless otherwise indicated.
 - 1. Available Manufacturers:
 - a. Arrow USA; an ASSA ABLOY Group company (ARW).
 - b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (CR).
 - c. DORMA Architectural Hardware; Member of The DORMA Group North America (DAH).
 - d. Dor-O-Matic; an Ingersoll-Rand Company (DOR).
 - e. LCN Closers; an Ingersoll-Rand Company (LCN).
 - f. Norton Door Controls; an ASSA ABLOY Group company (NDC).
 - g. Rixson Specialty Door Controls; an ASSA ABLOY Group company (RIX).
 - h. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SGT).
 - i. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

2.12 PROTECTIVE TRIM UNITS

- A. Size: 1-1/2 inches (38 mm) less than door width on push side and 1/2 inch (13 mm) less than door width on pull side, by height specified in door hardware sets.
- B. Metal Protective Trim Units: BHMA A156.6; beveled top and 2 sides; fabricated from the following material:
 - 1. Material: 0.050-inch- (1.3-mm-) thick stainless steel.
 - 2. Available Manufacturers:
 - a. American Floor Products Co., Inc. (AFP).
 - b. Baldwin Hardware Corporation (BH).
 - c. Burns Manufacturing Incorporated (BM).
 - d. Don-Jo Mfg., Inc. (DJO).
 - e. Hager Companies (HAG).
 - f. Hiawatha, Inc. (HIA).
 - g. IPC Door and Wall Protection Systems, Inc.; Div. of InPro Corporation (IPC).
 - h. IVES Hardware; an Ingersoll-Rand Company (IVS).
 - i. Pawling Corporation (PAW).
 - j. Rockwood Manufacturing Company (RM).
 - k. Trimco (TBM).

2.13 STOPS AND HOLDERS

- A. Stops and Bumpers: BHMA A156.16, Grade 1.
 - 1. Provide floor stops for doors unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic. Where floor or wall stops are not appropriate, provide overhead holders.
- B. Combination Floor and Wall Stops and Holders: BHMA A156.8, Grade 1.
- C. Silencers for Door Frames: BHMA A156.16, Grade 1; neoprene or rubber; fabricated for drilled-in application to frame.

2.14 DOOR GASKETING

- A. Standard: BHMA A156.22.
- B. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
 - 1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- C. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- D. Gasketing Materials: ASTM D 2000 and AAMA 701/702.

2.15 THRESHOLDS

- A. Standard: BHMA A156.21.
- B. Accessibility Requirements: Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
- C. Thresholds for Means of Egress Doors: Comply with NFPA 101. Maximum 1/2 inch (13 mm) high.

2.16 FABRICATION

- A. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.
- B. Fasteners: Provide screws according to commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

- C. Finishes: BHMA A156.18, as indicated in door hardware sets.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Steel Doors and Frames: Comply with DHI A115 Series. Drill and tap doors and frames for surface-applied door hardware according to ANSI A250.6.
- B. Mounting Heights: Mount door hardware units at heights indicated as follows unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- C. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- E. Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 - 2. Door Closers: Unless otherwise required by authorities having jurisdiction, adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Windows.
 - 2. Doors.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 by a qualified professional engineer, using the following design criteria:
 - 1. Design Wind Pressures: As required by Code.
 - 2. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.

1.3 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
 - 1. Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.4 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Preconstruction adhesion and compatibility test report.

1.5 QUALITY ASSURANCE

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA's "Laminated Glazing Reference Manual."
- B. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

1.6 WARRANTY

- A. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

- A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
- B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.
- C. Windborne-Debris-Impact Resistance: Provide exterior glazing that passes basic protection testing requirements in ASTM E 1996 for Wind Zone 1 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on the Project and shall be installed in same manner as glazing indicated for use on the Project.
 - 1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.

- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.2 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (tinted) unless otherwise indicated.

1. Products: Subject to compliance with requirements, provide available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. AFG Industries, Inc.; Krystal Klear.
 - b. Guardian Industries Corp.; Ultrawhite.
 - c. Pilkington North America; Optiwhite.
 - d. PPG Industries, Inc.; Starphire.

- B. Reflective-Coated Vision Glass: ASTM C 1376, coated by pyrolytic process and complying with other requirements specified.

1. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
 - a. Pilkington North America PPG Industries Inc, Guardian Glass.
2. Kind: Kind CV (coated vision glass), except that Kind CO (coated overhead glass) may be used where the lower edge of the glass is more than 6 feet (1.8 m) above the adjacent floor level or cannot be approached closer than 10 feet (3.0 m).
3. Coating Color: Pewter.
4. Glass: Tinted float.
5. Tint Color: Gray.
6. Visible Light Transmittance: 60 percent minimum.

2.3 LAMINATED GLASS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cardinal Glass Industries
2. Viracon
3. Pilkington North America.

- B. Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - 1. Construction: Laminate glass with polyvinyl butyral interlayer or cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written recommendations.
 - 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 - 3. Interlayer Color: Clear unless otherwise indicated.
- C. Windborne-Debris-Impact-Resistant Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, with "Windborne-Debris-Impact Resistance" Paragraph in "Glass Products, General" Article, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - 1. Construction: Laminate glass with one of the following to comply with interlayer manufacturer's written recommendations:
 - a. Polyvinyl butyral interlayer.
 - b. Polyvinyl butyral interlayers reinforced with polyethylene terephthalate film.
 - c. Ionoplast interlayer.
 - d. Cast-in-place and cured-transparent-resin interlayer.
 - e. Cast-in-place and cured-transparent-resin interlayer reinforced with polyethylene terephthalate film.
 - 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 - 3. Interlayer Color: Clear unless otherwise indicated.

2.4 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
 - 1. Neoprene complying with ASTM C 864.
 - 2. EPDM complying with ASTM C 864.
 - 3. Silicone complying with ASTM C 1115.
 - 4. Thermoplastic polyolefin rubber complying with ASTM C 1115.
- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene EPDM silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.
 - 1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

- C. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; non-staining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- D. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
 - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.5 MISCELLANEOUS GLAZING MATERIALS

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- F. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

- B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Apply heel bead of elastomeric sealant.
- F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.4 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.5 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION 088000

SECTION 088300 - MIRRORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the following types of silvered flat glass mirrors:

1. Annealed monolithic glass mirrors.
2. Tempered glass mirrors qualifying as safety glazing.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachments to other work.
- C. Samples:
1. Mirrors: 12 inches (300 mm) square, including edge treatment on two adjoining edges.
 2. Mirror Clips: Full size.
 3. Mirror Trim: 12 inches (300 mm) long.
- D. Preconstruction test reports.
- E. Maintenance data.
- F. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

- A. Glazing Publications: Comply with GANA's "Glazing Manual" and "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."
- B. Safety Glazing Products: For tempered mirrors, provide products complying with testing requirements in 16 CFR 1201 for Category II materials.
- C. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing and substrates on which mirrors are installed.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which mirror manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as

defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SILVERED FLAT GLASS MIRRORS

- A. Glass Mirrors, General: ASTM C 1503; manufactured using copper-free, low-lead mirror coating process.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Arch Aluminum & Glass Co., Inc.
- b. Avalon Glass and Mirror Company.
- c. Binswanger Mirror; a division of Vitro America, Inc.
- d. D & W Incorporated
- e. Donisi Mirror Company.
- f. Gardner Glass, Inc.
- g. Gilded Mirrors, Inc.
- h. Guardian Industries.
- i. Head West.
- j. Independent Mirror Industries, Inc.
- k. Lenoir Mirror Company.
- l. Maran-Wurzell Glass & Mirror.
- m. National Glass Industries.
- n. Stroupe Mirror Co., Inc.
- o. Sunshine Mirror; Westshore Glass Corp.
- p. Virginia Mirror Company, Inc.
- q. Walker Glass Co., Ltd.

- B. Tempered Clear Glass: Mirror Glazing Quality, for blemish requirements; and comply with ASTM C 1048 for Kind FT, Condition A, tempered float glass before silver coating is applied.

1. Nominal Thickness: 5.0 mm.

2.2 MISCELLANEOUS MATERIALS

- A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- B. Edge Sealer: Approved by mirror manufacturer.

- C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors.
- D. Film Backing for Safety Mirrors: Film backing and pressure-sensitive adhesive; both compatible with mirror backing paint as certified by mirror manufacturer.

2.3 MIRROR HARDWARE

- A. Top and Bottom Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover bottom and top edges of each mirror in a single piece.
 - 1. Finish: Clear bright anodized.
- B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.
- C. Anchors and Inserts: Provide devices as required for mirror hardware installation.

2.4 FABRICATION

- A. Cutouts: Fabricate cutouts before tempering for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.
- B. Mirror Edge Treatment: Flat polished. Seal edges of mirrors with edge sealer.
- C. Film-Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint as recommended in writing by film-backing manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.
 - 1. Verify compatibility with and suitability of substrates, including compatibility of mirror mastic with existing finishes or primers.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.
- B. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

- C. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
- D. Wall-Mounted Mirrors: Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
- E. Protect mirrors from breakage and contaminating substances resulting from construction operations.
- F. Do not permit edges of mirrors to be exposed to standing water.
- G. Maintain environmental conditions that will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.
- H. Wash exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash mirrors as recommended in writing by mirror manufacturer.

END OF SECTION 088300

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes non-load-bearing steel framing members for the following applications:
 - 1. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

PART 2 - PRODUCTS

2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
 - 2. Protective Coating: ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating, unless otherwise indicated.

2.2 STEEL FRAMING FOR FRAMED ASSEMBLIES

- A. Steel Studs and Runners: ASTM C 645.
 - 1. Minimum Base-Metal Thickness: 24 ga.
- B. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: 24 ga.
- C. Cold-Rolled Channel Bridging: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.

1. Depth: 1-1/2 inches (38.1 mm).
 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38.1 by 38.1 mm), 0.068-inch- (1.73-mm-) thick, galvanized steel.
- D. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base Metal Thickness: 0.0312 inch (0.79 mm).
 2. Depth: 1-1/2 inches (38.1 mm).
- E. Resilient Furring Channels: 1/2-inch- (12.7-mm-) deep, steel sheet members designed to reduce sound transmission.
1. Configuration: Asymmetrical or hat shaped.
- F. Cold-Rolled Furring Channels: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.
1. Depth: 3/4 inch (19.1 mm).
 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare-steel thickness of 0.0312 inch (0.79 mm).
 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.
- G. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (31.8 mm), wall attachment flange of 7/8 inch (22.2 mm), minimum bare-metal thickness of 0.0179 inch (0.45 mm), and depth required to fit insulation thickness indicated.

2.3 AUXILIARY MATERIALS

- A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

3.2 INSTALLING FRAMED ASSEMBLIES

- A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- B. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to

terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb, unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (12.7-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
3. Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

C. Z-Furring Members:

1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches (610 mm) o.c.
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (600 mm) o.c.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (300 mm) from corner and cut insulation to fit.

- D. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 092400 - PORTLAND CEMENT PLASTERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior portland cement plasterwork (stucco) on metal lath and .

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.
- C. Samples: For each type of factory-prepared finish coat indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Where indicated, provide portland cement plaster assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Sound-Transmission Characteristics: Where indicated, provide portland cement plaster assemblies identical to those of assemblies tested for STC ratings per ASTM E 90 and classified according to ASTM E 413 by a qualified testing agency.
- C. Mockups: Before plastering, install mockups of at least 100 sq. ft. (9.3 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 PROJECT CONDITIONS

- A. Comply with ASTM C 926 requirements.

PART 2 - PRODUCTS

2.1 METAL LATH

- A. Expanded-Metal Lath: ASTM C 847 with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
 - 1. Diamond-Mesh Lath: Self-furring, 2.5 lb/sq. yd. (1.4 kg/sq. m).
- B. Paper Backing: FS UU-B-790, Type I, Grade B, Style 1a vapor-retardant paper.
 - 1. Provide paper-backed lath in locations indicated on Drawings.

2.2 ACCESSORIES

- A. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Metal Accessories:
 - 1. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G60 (Z180) zinc coating.
 - 2. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
 - 3. External-Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
 - 4. Cornerbeads: Fabricated from zinc.
 - a. Small-nose style; use unless otherwise indicated.
 - 5. Casing Beads: Fabricated from zinc; square-edged style; with expanded flanges.
 - 6. Control Joints: Fabricated from zinc; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
 - 7. Expansion Joints: Fabricated from zinc; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
 - 8. Two-Piece Expansion Joints: Fabricated from zinc; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch (6.34 to 16 mm) wide; with perforated flanges.

2.3 MISCELLANEOUS MATERIALS

- A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in portland cement plaster.
- C. Bonding Compound: ASTM C 932.

- D. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.
- E. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.

2.4 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
 - 1. Color for Finish Coats: Gray.
- B. Masonry Cement: ASTM C 91, Type N.
 - 1. Color for Finish Coats: Gray.
- C. Plastic Cement: ASTM C 1328.
- D. Colorants for Job-Mixed Finish Coats: Colorfast mineral pigments that produce finish plaster color.
- E. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.
- F. Sand Aggregate: ASTM C 897.
 - 1. Color for Job-Mixed Finish Coats: White.
- G. Perlite Aggregate: ASTM C 35.
- H. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, coloring agents, and proprietary ingredients.
 - 1. Color: As selected by Architect from manufacturer's full range.
- I. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems, formulated with colorfast mineral pigments and fine aggregates; for use over portland cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.
 - 1. Color: As selected by Architect from manufacturer's full range.

2.5 PLASTER MIXES

- A. General: Comply with ASTM C 926 for applications indicated.
- B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:
 - 1. Portland Cement Mixes:

- a. Scratch Coat: For cementitious material, mix 1-part portland cement and 0 to 3/4 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
- b. Brown Coat: For cementitious material, mix 1-part portland cement and 0 to 3/4 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

C. Job-Mixed Finish-Coat Mixes:

- 1. Portland Cement Mix: For cementitious materials, mix 1-part portland cement and 3/4 to 1-1/2 parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
- 2. Masonry Cement Mix: 1-part masonry cement and 1-1/2 to 3 parts aggregate.
- 3. Portland and Masonry Cement Mix: For cementitious materials, mix 1-part portland cement and 1-part masonry cement. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
- 4. Plastic Cement Mix: 1-part plastic cement and 1-1/2 to 3 parts aggregate.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Prepare solid substrates for plaster that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

3.2 INSTALLATION, GENERAL

- A. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.
- B. Sound Attenuation Blankets: Where required, install blankets before installing lath unless blankets are readily installed after lath has been installed on one side.
- C. Acoustical Sealant: Where required, seal joints between edges of plasterwork and abutting construction with acoustical sealant.

3.3 INSTALLING METAL LATH

- A. Expanded-Metal Lath: Install according to ASTM C 1063.
 - 1. On Solid Surfaces, Not Otherwise Furred: Install self-furring, diamond-mesh lath.

3.4 INSTALLING ACCESSORIES

- A. Install according to ASTM C 1063 and at locations indicated on Drawings.

B. Reinforcement for External Corners:

1. Install lath-type, external-corner reinforcement at exterior locations.
2. Install cornerbead at exterior locations.

C. Control Joints: Install control joints at locations indicated on Drawings.

1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
 - a. Vertical Surfaces: 144 sq. ft. (13.4 sq. m).
 - b. Horizontal and other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).
2. At distances between control joints of not greater than 18 feet (5.5 m) o.c.
3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
4. Where control joints occur in surface of construction directly behind plaster.
5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

3.5 PLASTER APPLICATION

- A. General: Comply with ASTM C 926.

3.6 STUCCO REPAIRS

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

END OF SECTION 092400

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Interior gypsum board.
 - 2. Exterior gypsum board for walls, ceilings and soffits.
 - 3. Tile backing panels.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

PART 2 - PRODUCTS

2.1 INTERIOR GYPSUM BOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Gypsum Co.
 - b. BPB America Inc.
 - c. G-P Gypsum.
 - d. Lafarge North America Inc.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. Temple.
 - h. USG Corporation.
- B. Regular Type:

1. Thickness: 5/8 inch.
2. Long Edges: Tapered.

C. Type X:

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

D. Moisture- and Mold-Resistant Type: With moisture- and mold-resistant core and surfaces.

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

E. Abuse-Resistant Type: With high-density core.

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

2.2 TILE BACKING PANELS

A. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M or ASTM C 1396/C 1396M.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Gypsum Co.
 - b. BPB America Inc.
 - c. G-P Gypsum.
 - d. Lafarge North America Inc.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. Temple.
 - h. USG Corporation.
2. Core: 5/8 inch (15.9 mm), Type X.

B. Glass-Mat, Water-Resistant Backing Board:

1. Complying with ASTM C 1178/C 1178M.
 - a. Product: Subject to compliance with requirements, provide "DensShield Tile Guard" by G-P Gypsum.

2.3 EXTERIOR GYPSUM BOARD FOR WALLS, CEILINGS AND SOFFITS

A. Exterior Gypsum Soffit Board: ASTM C 931/C 931M or ASTM C 1396/C 1396M, with manufacturer's standard edges.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum Co.
 - b. BPB America Inc.
 - c. G-P Gypsum.
 - d. Lafarge North America Inc.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. Temple.
 - h. USG Corporation.
3. Core: 5/8 inch (15.9 mm), Type X.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Plastic.
2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.
 - g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Wallboard: Paper.
2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
3. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

- a. Use setting-type compound for installing paper-faced metal trim accessories.
- 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
- 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
- D. Joint Compound for Tile Backing Panels:
 - 1. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

3.2 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Regular Type: Vertical surfaces, unless otherwise indicated.
 - 2. Type X: Where required for fire-resistance-rated assembly.
 - 3. Moisture- and Mold-Resistant Type: Within 5' 2" of plumbing fixtures and on existing CMU walls.
 - 4. Abuse-Resistant Type: In residential areas of second floor.

3.3 APPLYING TILE BACKING PANELS

- A. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in other Division 09 Sections.
- E. Glass-Mat, Water-Resistant Backing Panels: Finish according to manufacturer's written instructions.

3.6 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 093000 - TILING

PART 1 - PRODUCTS

1.1 TILE PRODUCTS

A. Available Manufacturers:

1. American Olean; Div. of Dal-Tile International Corp.
2. Buchtal Corporation USA.
3. Crossville Ceramics Company, L.P.
4. Daltile; Div. of Dal-Tile International Inc.
5. Florida Tile Industries, Inc.
6. Interceramic.
7. Metropolitan Ceramics.
8. Monarch Tile, Inc.
9. Porcelanite, Inc.
10. Quarry Tile Company.
11. Summitville Tiles, Inc.
12. United States Ceramic Tile Company.

B. ANSI Ceramic Tile Standard: Provide Standard grade tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.

C. Unglazed Ceramic Mosaic Tile CT-1: Factory-mounted flat tile as follows:

1. Composition: Porcelain.
2. Surface: Slip-resistant, with abrasive admixture.
3. Module Size: 12" by 12 inches.
4. Basis-of-Design Product: Interceramic-Intertech Ararat or a comparable product of one of the following:

D. Glazed Wall Tile CT-2: Flat tile as follows:

1. Module Size: 6 by 6 inches (152 by 152 mm).
2. Basis-of-Design Product: Interceramic Wall Tile Collection or a comparable product of one of the following:

E. Glazed Wall Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing where applicable.

1. Base: Coved, module size 6 by 6 inches (152 by 152 mm).
2. Wainscot Cap: Bullnose, module size 6 by 6 inches (152 by 152 mm).
3. External Corners: Bullnose.
4. Internal Corners: Field-buttet square corners except with coved base and cap angle pieces designed to fit with stretcher shapes.

1.2 ACCESSORY MATERIALS

- A. Thresholds: Fabricate to provide transition between adjacent floor finishes. Bevel edges at 1:2 slope, limit height of bevel to 1/2 inch (12.7 mm) or less, and finish bevel to match face of threshold.
 - 1. Marble Thresholds: ASTM C 503 with a minimum abrasion resistance of **12** per ASTM C 1353 or ASTM C 241 and with honed finish.

1.3 SETTING AND GROUTING MATERIALS

- A. Available Manufacturers:
 - 1. Atlas Minerals & Chemicals, Inc.
 - 2. Boiardi Products Corporation.
 - 3. Bonsal, W. R., Company.
 - 4. Bostik.
 - 5. C-Cure.
 - 6. Custom Building Products.
 - 7. DAP, Inc.
 - 8. Jamo Inc.
 - 9. LATICRETE International Inc.
 - 10. MAPEI Corporation.
 - 11. Southern Grouts & Mortars, Inc.
 - 12. Summitville Tiles, Inc.
 - 13. TEC Specialty Products Inc.
- B. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.1A.
- C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
 - 1. Prepackaged dry-mortar mix containing dry additive to which only water must be added.
 - 2. Prepackaged dry-mortar mix combined with liquid-latex additive.
 - 3. For wall applications, provide non-sagging mortar.
- D. Water-Cleanable, Tile-Setting Epoxy Adhesive: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- E. Standard Sanded Cement Grout: ANSI A118.6, color as indicated.
- F. Standard Un-Sanded Cement Grout: ANSI A118.6, color as indicated.

PART 2 - EXECUTION

2.1 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. At showers, tubs, and where indicated, install cementitious backer units and treat joints to comply with ANSI A108.11.
- D. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.
 - 1. Exterior tile floors.
 - 2. Tile floors in wet areas.
 - 3. Tile swimming pool decks.
 - 4. Tile floors in laundries.
 - 5. Tile floors composed of tiles 8 by 8 inches (200 by 200 mm) or larger.
 - 6. Tile floors composed of rib-backed tiles.

2.2 FLOOR TILE INSTALLATION SCHEDULE

- A. Interior floor installation on concrete; thin-set mortar; TCA F113.
 - 1. Thin-Set Mortar: Latex- Portland cement mortar.
 - 2. Grout: Polymer-modified sanded grout.
- B. Interior floor installation on concrete; water-cleanable epoxy adhesive; TCA F116.
 - 1. Grout: Polymer-modified sanded grout.

2.3 WALL TILE INSTALLATION SCHEDULE

- A. Interior wall installation over masonry or concrete; thin-set mortar; TCA W202.
 - 1. Thin-Set Mortar: Latex- Portland cement mortar.
 - 2. Grout: Polymer-modified sanded grout.
- B. Interior wall installation; thin-set mortar; over cementitious backer units; TCA W244.
 - 1. Thin-Set Mortar: Latex- Portland cement mortar.
 - 2. Grout: Polymer-modified sanded grout.
- C. Interior bathtub wall installation; thin-set mortar; over cementitious backer units; TCA B412.
 - 1. Thin-Set Mortar: Latex-Portland cement mortar.
 - 2. Grout: Polymer-modified sanded grout.

END OF SECTION 093000

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes acoustical panels and exposed suspension systems for ceilings.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each exposed finish.
- C. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics:
 - 1. Surface-Burning Characteristics: Acoustical panels complying with ASTM E 1264 for Class A materials, when tested per ASTM E 84.
 - a. Smoke-Developed Index: 450 or less.

PART 2 - PRODUCTS

2.1 ACOUSTICAL PANEL CEILINGS, GENERAL

- A. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 - 1. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.
- B. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 1. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.

- C. Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.

2.2 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Armstrong World Industries, Inc.
 - 2. BPB USA.
 - 3. Chicago Metallic Corporation.
 - 4. Ecophon CertainTeed, Inc.
 - 5. Tectum Inc.
 - 6. USG Interiors, Inc.
 - 7. Rockfon LLC
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Rockfon "Alaska"
- C. Classification: Provide panels complying with ASTM E 1264 for type and form as follows:
 - 1. Type and Form: Type XX, other types; described as high-density, ceramic- and mineral-base panels with scrubbable finish, resistant to heat, moisture, and corrosive fumes.
- D. Color: White.
- E. LR: Not less than .86.
- F. NRC: Not less than .90.
- G. CAC: Not less than 22.
- H. AC: Not less than 180.
- I. Edge/Joint Detail: Square.
- J. Thickness: 3/4 inch (19 mm).
- K. Modular Size: 24 by 24 inches (610 by 610 mm).

2.3 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- B. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. BPB USA.
 - 3. Chicago Metallic Corporation.

4. Ecophon CertainTeed, Inc.
 5. USG Interiors, Inc.
 6. Rockfon LLC
- C. Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation, with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges.
1. Structural Classification: Heavy-duty system.
 2. End Condition of Cross Runners: Override (stepped) type.
 3. Cap Material: Steel cold-rolled sheet.
 4. Cap Finish: Painted white.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with ASTM C 636, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders.
- C. Suspend ceiling hangers from building's structural members, plumb and free from contact with insulation or other objects within ceiling plenum. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers, use trapezes or equivalent devices. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.
- E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

END OF SECTION 095113

SECTION 096516 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vinyl sports floor covering.
 - 2. Playground Turf.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each type of floor covering. Include floor covering layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
- C. Samples: In manufacturer's standard size, but not less than 6-by-9-inch (150-by-230-mm) sections of each different color and pattern of floor covering required.
- D. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.4 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive floor coverings.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.
- C. Close spaces to traffic during floor covering installation.
- D. Close spaces to traffic for 48 hours after floor covering installation.
- E. Install floor coverings after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 VINYL SHEET FLOOR COVERING

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis of Design: Tarkett, Inc.: Omnisports 7.1 min:
 - 1. Armstrong World Industries, Inc.
 - 2. Congoleum Corporation.
 - 3. Forbo Flooring, Inc.
 - 4. Mannington Mills, Inc.
 - 5. Polyflor, Ltd., Distributed by Gerbert Limited.
- C. Vinyl Sheet Floor Covering with Backing: ASTM F 1303.
 - 1. Type (Binder Content): Type I, minimum binder content of 90 percent.
 - 2. Wear-Layer Thickness: PVC.
 - 3. Overall Thickness: As standard with manufacturer.
 - 4. Interlayer Material: PVC with interwoven fiberglass.
- D. Wearing Surface: Embossed with embedded abrasives.
- E. Sheet Width: 12 feet (3.6 m).
- F. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 PLAYGROUND TURF:

- A. Products: 90oz./sq. yd. polyethylene yarn artificial turf with 1" pile height with dual backing system and perforated holes for drainage.
- B. Basis of Design: Turf Factory Direct: TFD K-9 Supreme.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of floor coverings.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor coverings until they are same temperature as space where they are to be installed.
 1. Move floor coverings and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by floor coverings immediately before installation.

3.2 FLOOR COVERING INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor coverings.
- B. Unroll floor coverings and allow them to stabilize before cutting and fitting.
- C. Lay out floor coverings as follows:
 1. Maintain uniformity of floor covering direction.
 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (152 mm) away from parallel joints in floor covering substrates.
 3. Match edges of floor coverings for color shading at seams.
 4. Avoid cross seams.
- D. Scribe and cut floor coverings to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.
- E. Extend floor coverings into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, or openings that are in place or marked for future cutting by repeating on floor coverings as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Adhere floor coverings to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.3 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor covering.
- B. Cover floor coverings until Substantial Completion.

END OF SECTION 096516

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid Vinyl floor tile.
 - 2. Vinyl composition floor tile.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: Full-size units of each color and pattern of floor tile required.
- C. Maintenance data.

1.3 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive floor tile.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 SOLID VINYL FLOOR TILE

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Altro Group
 - 2. Amtico Studio (The), Amtico International Inc
 - 3. Armstrong World Industries, Inc
 - 4. Burke Mercer Flooring Products, Division of Burke Industries Inc
 - 5. Estrie Products International, American Biltrite (Canada) Ltd
 - 6. Flexco

7. Gemtec Inc
8. Gerflor, Architectural Floor Systems, Inc
9. Johnsonite
10. Polyflor, Ltd., Distributed by Gerbert Limited
11. Roppe Corporation, USA
12. Tarkett, Inc
13. TOLI International
14. VPI, LLC, Floor Products Division
15. Centiva; Victory Series

B. Tile Standard: ASTM F 1700.

1. Class: Class III, printed film vinyl tile.
2. Type: Type B, embossed surface.

C. Thickness: 0.120 inch (3.0 mm).

D. Size: 18 by 18 inches (457 by 457 mm).

E. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 VINYL COMPOSITION FLOOR TILE

A. Products: Subject to compliance with requirements, available manufacturers that may be incorporated into the Work include, but are not limited to, the following:

1. AB ColorPlus, American Biltrite (Canada) Ltd.
2. Armstrong World Industries, Inc
3. Congoleum Corporation.
4. Mannington Mills, Inc.
5. Tarkett, Inc.
6. Vinylasa Tile, Distributed by American Tile Inc.

B. Tile Standard: ASTM F 1066, Class 1, solid-color tile.

C. Wearing Surface: Smooth.

D. Thickness: 0.125 inch (3.2 mm).

E. Size: 12 by 12 inches (305 by 305 mm).

F. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

- B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.
 - 1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. VCT and Asphalt Tile Adhesives: Not more than 50 g/L.
- C. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are same temperature as space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.2 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles square with room axis.

- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles with grain direction alternating in adjacent tiles (basket-weave pattern).
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- G. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.3 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- B. Floor Polish: Remove soil, visible adhesive and surface blemishes from floor tile surfaces before applying liquid floor polish if required by manufacturer.
- C. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096723-RESINOUS FLOORING

PART 1 – GENERAL

1.2 SUMMARY

A. This section includes the following:

1. Resinous flooring system as shown on the drawings and in schedules.

1.3 SYSTEM DESCRIPTION

- A. The work shall consist of preparation of the substrate, the furnishing and application of a cementitious urethane based self-leveling seamless flooring system with decorative quartz aggregate broadcast and Epoxy broadcast and topcoats.
- B. The system shall have the color and texture as specified by the Owner with a nominal thickness of 1/4 inch. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.
- C. Cove base (if required) to be applied where noted on plans and per manufacturers standard details unless otherwise noted

1.4 SUBMITTALS

- A. Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.
- B. Manufacturer's Material Safety Data Sheet (MSDS) for each product being used.
- C. Samples: A 3 x 3-inch square sample of the proposed system. Color, texture, and thickness shall be representative of overall appearance of finished system subject to normal tolerances.

1.5 QUALITY ASSURANCE

- A. The Manufacturer shall have a minimum of 10 years experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.
- B. The Applicator shall have experience in installation of the flooring system as confirmed by the manufacturer in all phases of surface preparation and application of the product specified.
- C. A pre-installation conference shall be held between Applicator, General Contractor and the Owner to review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping
 1. All components of the system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the product type and batch number.
- B. Storage and Protection
 1. The Applicator shall be provided with a dry storage area for all components. The area shall be between 60 F and 85 F, dry, out of direct sunlight and in accordance with the Manufacturer's recommendations and relevant health and safety regulations.

1.7 PROJECT CONDITIONS

A. Site Requirements

1. Application may proceed while air, material and substrate temperatures are between 60 F and 85 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.
3. The Applicator shall ensure that adequate ventilation is available for the work area. This shall include the use of manufacturer's approved fans, smooth bore tubing and closure of the work area.
4. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.

B. Conditions of new concrete to be coated with cementitious urethane material.

1. Concrete shall be moisture cured for a minimum of 3 days and have fully cured a minimum of 5 days in accordance with ACI-308 prior to the application of the coating system pending moisture tests.
2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary nor desirable).
3. Sealers and curing agents should not be used.
4. Concrete shall have minimum design strength of 3,500 psi. and a maximum water/cement ratio of 0.45
5. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.

PART 2 – PRODUCTS

2.1 FLOORING

A. Dur-A-Flex, Inc, Hybri-Flex EQ (self leveling broadcast quartz), epoxy/aliphatic urethane topcoat seamless flooring system.

1. System Materials:
 - a. Topping: Dur-A-Flex, Inc, Poly-Crete MD resin, hardener and SL aggregate.
 - b. The broadcast aggregate shall be Dur-A-Flex, Inc. Q28 or Q11 quartz aggregate.
 - c. Broadcast: Dur-A-Flex, Inc. Dur-A-Glaze #4, epoxy based two-component resin.
 - d. Grout coat: Dur-A-Flex, Inc Dur-A-Glaze #4, epoxy-based, two-component resin.
 - e. Top coat: Dur-A-Flex, Inc. Armor Top aliphatic urethane two-component resin.
2. Patch Materials
 - a. Shallow Fill and Patching: Use Dur-A-Flex, Inc. Poly-Crete MD (up to ¼ inch).
 - b. Deep Fill and Sloping Material (over ¼ inch): Use Dur-A-Flex, Inc. Poly-Crete WR.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.
- 1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

3.2 PREPARATION

A. General

- 1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
- 2. Moisture Testing: Perform tests recommended by manufacturer and as follows.
 - a. Perform anhydrous calcium chloride test ASTM F 1869-98. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 20 lbs/1,000 sf/24 hrs.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 99% relative humidity level measurement.
 - c. If the vapor drive exceeds 99% relative humidity or 20 lbs/1,000 sf/24 hrs then the Owner and/or Engineer shall be notified and advised of additional cost for the possible installation of a vapor mitigation system that has been approved by the manufacturer or other means to lower the value to the acceptable limit.
- 3. Mechanical surface preparation
 - a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-5 as described by the International Concrete Repair Institute.
 - b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
 - c. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 1/4-inch key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.
 - d. Cracks and joints (non-moving) greater than 1/8-inch-wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.
- 4. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufacturer's recommendations.

3.3 APPLICATION

A. General

1. The system shall be applied in five distinct steps as listed below:
 - a. Substrate preparation
 - b. Topping/overlay application with quartz aggregate broadcast.
 - c. Resin application with quartz aggregate broadcast.
 - d. Topcoat application
 - e. Second topcoat application.
2. Immediately prior to the application of any component of the system, the surface shall be dry, and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Topping

1. The topping shall be applied as a self-leveling system as specified by the Architect. The topping shall be applied in one lift with a nominal thickness of 1/8 inch.
2. The topping shall be comprised of three components, a resin, hardener and filler as supplied by the Manufacturer.
3. The hardener shall be added to the resin and thoroughly dispersed by suitably approved mechanical means. SL Aggregate shall then be added to the catalyzed mixture and mixed in a manner to achieve a homogenous blend.
4. The topping shall be applied over horizontal surfaces using ½ inch “v” notched squeegee, trowels or other systems approved by the Manufacturer.
5. Immediately upon placing, the topping shall be degassed with a loop roller.
6. Quartz aggregate shall be broadcast to excess into the wet material at the rate of 0.8 lbs/sf.
7. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

C. Broadcast

1. The broadcast coat resin shall be applied at the rate of 90 sf/gal (Q28) or 50 sf/gal (Q11).
2. The broadcast coat shall be comprised of liquid components, combined at a ratio of 2 parts resin to 1-part hardener by volume and shall be thoroughly blended by mechanical means such as a high-speed paddle mixer.
3. Quartz aggregate shall be broadcast into the wet resin at the rate of 0.5 lbs/sf.
4. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

D. Grout coat

1. The grout coat shall be squeegee applied with a coverage rate of 90 sf/gal (Q28) or 50 sf/gal (Q11).
2. The grout coat shall be comprised of liquid components, combined at a ratio of 2 parts resin to 1-part hardener by volume and shall be thoroughly blended by mechanical means such as a high-speed paddle mixer.

3. The grout coat will be back rolled and cross rolled to provide a uniform texture and finish.

E. Topcoat

1. The topcoat shall be roller applied with a coverage rate of 500 sf/gal.
2. The finished floor will have a nominal thickness of 1/4 inch.

3.5 CLEANING AND PROTECTION

- A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
- B. Remove masking. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

END OF SECTION 096723

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes modular, fusion-bonded carpet tile.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show the following:
 - 1. Carpet tile type, color, and dye lot.
 - 2. Pattern of installation.
 - 3. Insets and borders.
 - 4. Edge, transition, and other accessory strips.
 - 5. Transition details to other flooring materials.
- C. Samples: For each color and texture required.
 - 1. Carpet Tile: Full-size Sample.
 - 2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.
- E. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.
- B. Mockups: Before installing carpet tile, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104, Section 5, "Storage and Handling."

1.5 PROJECT CONDITIONS

- A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."
- B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.6 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.

- 1. Warranty Period: 10 years from date of Substantial Completion.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd. (8.3 sq. m).

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- B. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Shaw No Rules Collection
 - a. Color: As selected by Architect from manufacturer's full range.
 - b. Pattern: Color Play

c. Source: Shaw Contract Group, shawcontractgroup.com, 1-800-257-7429

- C. Fiber Content: 100 percent nylon 6, 6
- D. Pile Characteristic: Level-loop pile.
- E. Density: 18.0 oz./cu. yd. (g/cu. cm.)
- F. Pile Thickness: 0.085 inches (2.16 mm) for finished carpet tile [per ASTM D 6859.
- G. Stitches: 9 stitches per inch (mm).
- H. Gage: 1/2 ends per inch (mm).
- I. Primary Backing/Backcoating: Reinforced thermoplastic copolymer.
- J. Secondary Backing: Manufacturer's standard material.
- K. Size: 24 by 24 inches (610 by 610 mm).
- L. Applied Soil-Resistance Treatment: Manufacturer's standard material.
- M. Antimicrobial Treatment: Manufacturer's standard material.
- N. Performance Characteristics: As follows:
 - 1. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm.
 - 2. Dry Breaking Strength: Not less than 100 lbf (445 N) per ASTM D 2646.
 - 3. Tuft Bind: Not less than 3 lbf (13 N) per ASTM D 1335.
 - 4. Delamination: Not less than 3.5 lbf/in. (15 N/mm) per ASTM D 3936.
 - 5. Dimensional Tolerance: Within 1/32 inch (0.8 mm) of specified size dimensions, as determined by physical measurement.
 - 6. Dimensional Stability: 0.2 percent or less per ISO 2551 (Aachen Test).
 - 7. Resistance to Insects: Comply with AATCC 24.
 - 8. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria; not less than 1-mm halo of inhibition for gram-negative bacteria; no fungal growth; per AATCC 174.
 - 9. Electrostatic Propensity: Less than 3.5 kV per AATCC 134.
 - 10. Environmental Requirements: Provide carpet tile that complies with testing and product requirements of Carpet and Rug Institute's "Green Label Plus" program.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.

1. VOC Limits: Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by carpet tile manufacturer.
- C. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- D. Install pattern parallel to walls and borders.

END OF SECTION 096813

SECTION 099110 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes surface preparation and field painting of exposed exterior and items and surfaces, including but not limited to soffit canopy, gable ends, stucco, exposed structural steel, awning window frames, steel doors and frames.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1.2 SUBMITTALS

- A. Product Data: For each paint system indicated. Include block fillers and primers.
- B. Samples for Initial Selection: For each type of finish-coat material indicated.
- C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
 - 1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.

1.5 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).
- B. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.
- B. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Benjamin Moore & Co. (Benjamin Moore). Basis-of-Design unless otherwise noted
 - 2. Coronado Paint Company (Coronado). Basis of Design unless otherwise noted.
 - 3. Devoe Coatings. (Devoe)
- C. Coronado Paint Company will be shown in the specified systems. Products of manufacturer's listed above will be accepted meeting those specifications. Products of other manufacturer's not listed above shall not be accepted without written approval from the Architect.

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: As indicated by manufacturer's designations.

2.3 EXTERIOR PRIMERS

- A. Exterior Concrete and Masonry Primer: Factory-formulated alkali-resistant acrylic-latex primer for exterior application.
- B. Exterior Ferrous-Metal Primer: Factory-formulated rust-inhibitive metal primer for exterior application.
- C. Exterior non-ferrous or Galvanized Metal Primer: Factory-formulated galvanized metal primer for exterior application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - 2. Cementitious Materials: Power-wash concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - 3. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
 - 4. Non-ferrous or Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 3. Provide finish coats that are compatible with primers used.
 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
 9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
 10. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 2. Omit primer over metal surfaces that have been shop primed and touchup painted.
 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special

- attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
- F. Mechanical items to be painted include, but are not limited to, the following:
1. Uninsulated metal piping.
 2. Uninsulated plastic piping.
 3. Pipe hangers and supports.
 4. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.
- G. Electrical items to be painted include, but are not limited to, the following:
1. Switchgear.
 2. Panelboards.
 3. Electrical equipment that is indicated to have a factory-primed finish for field painting.
- H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- I. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

- K. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:
 - 1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
 - 2. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
 - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 EXTERIOR PAINT SCHEDULE

- A. Concrete, Stucco, EIFS, and Masonry (Other Than Concrete Unit Masonry): Provide the following finish systems over exterior concrete, stucco, and brick masonry substrates:
 - 1. Low-Luster Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Exterior concrete and masonry primer: Basis-of-Design: Ultra Spec High-Build Sealer 609.

- b. Finish Coats: Exterior low-luster acrylic paint: Basis-of-Design: Ultra Spec EXT Satin N448.
- B. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items. Basis-of-Design: Corotech V180, Rust Arrestor over rusted surfaces and Corotech V160 Epoxy Mastic. Structural Steel only: 35-147 Primer Alkyd Red Rust Scat.
 - 1. Semigloss Acrylic-Enamel Finish: Two finish coats over a rust-inhibitive primer.
 - a. Primer: Exterior ferrous-metal primer. Corotech Acrylic Metal Primer V110.
 - b. Finish Coats: Exterior semigloss acrylic enamel: Coronado Rust Scat Enamel 90 Line.
- C. Non-ferrous and Galvanized Metal: Provide the following finish systems over exterior zinc-coated metal surfaces:
 - 1. Full-Gloss Acrylic-Enamel Finish: Two finish coats over a galvanized metal primer.
 - a. Primer: Exterior galvanized metal primer. Basis-of-Design: Corotech Acrylic Metal Primer V110.
 - b. Finish Coats: Exterior full-gloss acrylic enamel for ferrous and other metals Basis-of-Design: Coronado Rust Scat Enamel 80 Line.

Interior Paint Schedule:

Concrete Masonry Units:

- 1. Acrylic Finish, two coats over block filler:
 - a. Block Filler; Coronado by Benjamin Moore Super Kote 5000 Block Filler 958 line.
 - b. Second and Third Coats: Ultra Spec SCUFF-X Interior Satin finish 486.
 - c. Sheen: Satin.

Gypsum Drywall:

- 1. Walls:
 - a. Primer: 1 coat of Benjamin Moore Prep-Coat Hi Build Primer 580.
 - b. Second and Third Coats: Ultra Spec SCUFF-X Interior Satin finish 486.
 - c. Sheen: Satin.
- 2. Ceilings:
 - a. Primer: 1 coat of Benjamin Moore Prep-Coat Hi Build Primer 580.
 - b. Second & Third Coats: Coronado by Benjamin Moore Super Kote 5000 Flat 28 line.
 - c. Sheen: Flat.

Hollow Metal Doors and Frames-Int/Ext Ferrous & Non-ferrous Metal:

- 1. Acrylic-Enamel Finish:
 - a. Primer: Spot coat of Corotech Acrylic Metal Primer V110.
 - b. Second and Third Coats: Corotech Rust Scat Enamel 90 line.
 - c. Sheen: Semi-Gloss.

D. Manufacturers and Suppliers Responsibilities:

1. Monitoring of critical phase points i.e.; cleaning, priming/sealing, caulking, and finishing will be performed periodically by either the manufacturer's rep. or the supplier's rep. The monitoring process will be random and unannounced. The monitoring process is strictly for the benefit and comfort of the Paint Company and the supplier. This is not an inspection that certifies conformance of the specification. A third party independent inspector should be employed by the Owner or Association for certified application inspection.
2. A final review of the project will be performed at the completion of the job, no warranty will be issued until a final review has been completed. This final review confirms that the products used are as specified.

E. Warranty Information:

1. (7) Seven Year, Non-Prorated, Limited Material and Labor Warranty Warrants that the materials used, as manufactured by Benjamin Moore, Coronado or Devoe Paints, are manufactured to specification and free from defects. These specified coatings will not flake, crack, peel, or blister when applied to a properly prepared masonry substrate, due to a material defect. This warranty does not apply to the condition of or to any failure of the pre-existing paints or any pre-existing structural defects. There is no warranty on metal or against rust or corrosion of metals, or discoloration from masonry alkalinity burn. Substrate repairs and mechanical damage of paint is not covered under warranty.

END OF SECTION 099110

SECTION 101400 - SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:

- 1. Plaques.

1.2 DEFINITIONS

- A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for signs.
 - 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
 - 2. Provide message list, typestyles, graphic elements including tactile characters and Braille, and layout for each sign.
- C. Samples: For each sign type and for each color and texture required.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

2.2 PANEL SIGNS

- A. Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner, complying with the following requirements:
 - 1. Acrylic Sheet: 0.060 inch (1.52 mm) thick.
 - 2. Edge Condition: Square cut.
 - 3. Corner Condition: Rounded to radius indicated.
 - 4. Mounting: Framed.
 - 5. Color: As indicated.
 - 6. Tactile Characters: Characters and Grade 2 Braille raised 1/32 inch (0.8 mm) above surface with contrasting colors.
- B. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils (0.076 mm) with pressure-sensitive adhesive backing. Apply copy to exposed face of panel sign.
 - 1. Panel Material: Opaque acrylic sheet.

2.3 ACCESSORIES

- A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.4 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.
 - 1. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
 - 2. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.5 ACRYLIC SHEET FINISHES

- A. Colored Coatings for Acrylic Sheet: For copy, background and frame colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for five years for application intended.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
- B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
1. Two-Face Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.

END OF SECTION 101400

SECTION 102113 - TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-polymer toilet compartments configured as toilet enclosures and urinal screens.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for each exposed product and for each color and texture specified.

1.3 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: 200 or less.
 2. Smoke-Developed Index: 450 or less.
- B. Regulatory Requirements: Comply with applicable provisions in "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" for toilet compartments designated as accessible.

PART 2 - PRODUCTS

2.1 SOLID-POLYMER UNITS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Accurate Partitions Corporation.
 2. Ampco, Inc.
 3. Bradley Corporation; Mills Partitions.
 4. Comtec Industries/Capitol Partitions.
 5. General Partitions Mfg. Corp.

6. Global Steel Products Corp.
7. Hadrian Manufacturing Inc.
8. Knickerbocker Partition Corporation.
9. Metpar Corp.
10. Partition Systems Incorporated of South Carolina.
11. Rockville Partitions Incorporated.
12. Santana Products, Inc.
13. Sanymetal; a Crane Plumbing company.
14. Weis-Robart Partitions, Inc.

B. Toilet-Enclosure Style: Overhead braced

C. Urinal-Screen Style: Wall hung.

D. Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch (25 mm) thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.

1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
2. Heat-Sink Strip: Manufacturer's standard continuous, stainless-steel strip fastened to exposed bottom edges of solid-polymer components to prevent burning.
3. Polymer Panel Finish: One color and pattern in each room.

a. Color and Pattern: As indicated by manufacturer's designations.

E. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; stainless steel.

F. Urinal-Screen Post: Manufacturer's standard post design of material matching the thickness and construction of pilasters; with shoe and sleeve (cap) matching that on the pilaster.

G. Brackets (Fittings):

1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.

2.2 ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.

1. Material: Stainless steel.
2. Hinges: Manufacturer's standard paired, self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees.
3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.

5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
 6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with anti-grip profile and in manufacturer's standard finish.
 - C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

2.3 FABRICATION

- A. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- B. Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.
- C. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment at bottoms of posts. Provide shoes at posts to conceal anchorage.
- D. Door Size and Swings: Unless otherwise indicated, provide 24-inch- (610-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
- B. Clearances: Maximum 1/2 inch (13 mm) between pilasters and panels; 1 inch (25 mm) between panels and walls.
- C. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than three brackets attached at midpoint and near top and bottom of panel. Locate wall brackets so holes for wall anchors occur in masonry or tile joints. Align brackets at pilasters with brackets at walls.

3.2 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION 102113

SECTION 102226 - OPERABLE PARTITIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manually operated, acoustical panel partitions.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design operable panel partitions including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:
 1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance according to ASTM E 90, determined by ASTM E 413, and rated for not less than the STC indicated.
 2. Acoustical Performance Requirements: Installed operable panel partition assembly, identical to partition tested for STC, tested for NIC according to ASTM E 336, determined by ASTM E 413, and rated for 10 dB less than STC value indicated 45dB.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 1. Indicate storage and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.
 2. Wiring Diagrams: For power, signal, and control wiring.
- C. Samples: For each type of exposed material, finish, covering, or facing indicated.
- D. Delegated-Design Submittal: For operable panel partitions indicated to comply with performance requirements, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Design Calculations: Calculate requirements for seismic restraints.
- E. Coordination Drawings: Reflected ceiling plans, drawn to scale and coordinated with each other, based on input from installers of the items involved:

- F. Setting Drawings: For embedded items and cutouts required in other work, including support-beam, mounting-hole template.
- G. Seismic Qualification Certificates: For operable panel partitions, accessories, and components, from manufacturer.
- H. Product certificates.
- I. Product test reports.
- J. Field quality-control reports.
- K. Operation and maintenance data.
- L. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.
- B. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- C. Testing Agency Qualifications: Qualified according to Division 01 Section "Quality Requirements" for testing indicated.
- D. Forest Certification: Fabricate products with wood, wood veneers, and wood-based panel products produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- E. Fire-Test-Response Characteristics: Provide panels with finishes meeting one of the following as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Surface-Burning Characteristics: As determined by testing per ASTM E 84.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 2. Fire Growth Contribution: Meeting acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265.
- F. Fire-Rated Door Assemblies: Comply with NFPA 80, based on testing according to UL 10B.
 - 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
- G. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- H. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel Frame: Steel sheet, manufacturer's standard thickness.
- B. Steel Face/Liner Sheets: Tension-leveled steel sheet, manufacturer's standard thickness.
- C. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use, corrosion resistance, and finish indicated; manufacturer's standard strengths and thicknesses for type of use.
- D. Particleboard: ANSI A208.1, made with binder containing no urea formaldehyde.
- E. Medium-Density Fiberboard: ANSI A208.2, made with binder containing no urea formaldehyde.

2.2 OPERABLE ACOUSTICAL PANELS

- A. Operable Acoustical Panels: Operable acoustical panel partition system, including panels, seals, finish facing, suspension system, operators, and accessories.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Basis-of-Design Product: Subject to compliance with requirements, provide Hufcor or comparable product by one of the following:
 - a. Advanced Equipment Corporation.
 - b. Curtition, Inc.
 - c. FolDoor; Holcomb & Hoke Mfg. Co., Inc.

- d. KWIK-WALL Company.
 - e. Moderco Inc.
 - f. Modernfold, Inc.; a DORMA Group Company.
 - g. Panelfold Inc.
- B. Panel Operation: Manually operated, paired panels.
- C. Panel Construction: Provide top reinforcement as required to support panel from suspension components and provide reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.
- D. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.
- E. STC: Not less than 45.
- F. Panel Closure: Manufacturer's standard.
- G. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.

2.3 SEALS

- A. General: Provide types of seals indicated that produce operable panel partitions complying with acoustical performance requirements and the following:
 - 1. Manufacturer's standard seals.
 - 2. Seals made from materials and in profiles that minimize sound leakage.
 - 3. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.
- B. Horizontal Bottom Seals: PVC-faced, mechanical, retractable, constant-force-contact seal exerting uniform constant pressure on floor when extended, ensuring horizontal and vertical sealing and resisting panel movement.
 - 1. Mechanically Operated for Acoustical Panels: Extension and retraction of bottom seal by operating handle or built-in operating mechanism, with operating range not less than 1-1/2 inches (38 mm) between retracted seal and floor finish.

2.4 FINISH FACING

- A. General: Provide finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.
 - 1. Color/Pattern: As selected by Architect from manufacturer's full range.

- B. High-Pressure Decorative Laminate: NEMA LD 3, Horizontal grade.
- C. Cap-Trimmed Edges: Protective perimeter-edge trim with tight hairline joints concealing edges of panel and finish facing.
- D. Trimless Edges: Fabricate exposed panel edges so finish facing wraps uninterrupted around panel, covering edge and resulting in an installed partition with facing visible on vertical panel edges, without trim, for minimal sightlines at panel-to-panel joints.

2.5 SUSPENSION SYSTEMS

- A. Suspension Tracks: Steel or aluminum with adjustable steel hanger rods for overhead support, designed for type of operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch (2.54 mm) between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.
- B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.
- C. Track Intersections, Switches, and Accessories: As required for type of operation, storage, track configuration, and layout indicated for operable panel partitions, and compatible with partition assembly specified. Fabricate track intersections and switches from steel or aluminum.
 - 1. Multidirectional Switches: Adjustable switch configuring track into L, T, or X intersections and allowing panels to be moved in all pass-through, 90-degree change, and cross-over travel direction combinations.
- D. Aluminum Finish: Mill finish or manufacturer's standard, factory-applied, decorative finish unless otherwise indicated.
- E. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.

2.6 ACCESSORIES

- A. Storage Pocket Door: Full height at end of partition runs to conceal stacked partition; of same materials, finish, construction, thickness, and acoustical qualities as panels; complete with operating hardware and acoustical seals at soffit, floor, and jambs. Hinges in finish to match other exposed hardware.
- B. Work Surfaces: Quantities, placement, and size indicated.
 - 1. Surface: Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with ASTM E 557 except as otherwise required by operable panel partition manufacturer's written installation instructions.
- B. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed.
- C. Install panels from marked packages in numbered sequence indicated on Shop Drawings.
- D. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.
- E. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.

3.2 ADJUSTING

- A. Adjust operable panel partitions to operate smoothly, without warping or binding. Lubricate hardware and other moving parts.
- B. Adjust storage pocket doors to operate smoothly and easily, without binding or warping. Check and readjust operating hardware. Confirm that latches and locks engage accurately and securely without forcing or binding.

3.3 FIELD QUALITY CONTROL

- A. Light-Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids; adjust partitions for acceptable fit.
- B. Testing Methodology: Perform testing of installed operable panel partition for noise isolation according to ASTM E 336, determined by ASTM E 413, and rated for not less than NIC indicated. Adjust and fit partitions to comply with NIC test method requirements.
- C. Repair or replace operable panel partitions that do not comply with requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of repaired, replaced, or additional work with specified requirements.
- E. Prepare test and inspection reports.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION 102226

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Public-use washroom accessories.
2. Childcare accessories.
3. Underlavatory guards.
4. Custodial accessories.

B. Owner-Furnished Material: Toilet Tissue Dispenser, Soap Dispenser, and Paper Towel Dispenser.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify products using designations indicated.

C. Maintenance data.

D. Warranty: Sample of special warranty.

1.3 WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PUBLIC-USE WASHROOM ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. A & J Washroom Accessories, Inc.
2. American Specialties, Inc.
3. Bobrick Washroom Equipment, Inc.
4. Bradley Corporation.
5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
6. Tubular Specialties Manufacturing, Inc.

B. Grab Bar:

1. Basis-of-Design Product: Bobrick "B-6806".
2. Mounting: Flanges with exposed fasteners.
3. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
 - a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
4. Outside Diameter: 1-1/4 inches (32 mm).
5. Configuration and Length: As indicated on Drawings.

C. Mirror Unit:

1. Basis-of-Design Product: Bobrick "B-165 series".
2. Frame: Stainless-steel channel. Retain first subparagraph below if required.
3. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.

D. Sanitary-Napkin Disposal Unit:

1. Basis-of-Design Product: Bobrick "B-270".
2. Mounting: Surface mounted.
3. Door or Cover: Self-closing, disposal-opening cover.
4. Receptacle: Removable.
5. Material and Finish: Stainless Steel

2.2 PRIVATE-USE SHOWER ROOM ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 1. A & J Washroom Accessories, Inc.
 2. American Specialties, Inc.
 3. Bobrick Washroom Equipment, Inc.
 4. Bradley Corporation.
 5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
 6. Tubular Specialties Manufacturing, Inc.

2.3 PRIVATE-USE BATHROOM ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Basco, Inc.
 2. Bobrick Washroom Equipment, Inc.
 3. Franklin Brass by Liberty Hardware Manufacturing Corporation; a Masco company.
 4. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
 5. Ginger; a Masco company.
 6. Seachrome Corporation.
 7. Tubular Specialties Manufacturing, Inc.
- B. Towel Bar:
1. Basis-of-Design Product: Bobrick "B-205".
 2. Description: 3/4-inch- (19-mm-) square tube with rectangular end brackets.
 3. Mounting: Flanges with exposed fasteners.
 4. Length: 24 inches (610 mm).
 5. Material and Finish: Stainless steel, No. 4 finish (satin).

2.4 CHILDCARE ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. American Specialties, Inc.
 2. Brocar Products, Inc.
 3. Diaper Deck & Company, Inc.
 4. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
 5. Koala Kare Products; a division of Bobrick Washroom Equipment, Inc.
 6. SSC, Inc.
 7. Tubular Specialties Manufacturing, Inc.
- B. Diaper-Changing Station:
1. Basis-of-Design Product: Bobrick "B-2200".
 2. Description: Vertical unit that opens by folding down from stored position and with child-protection strap.
 - a. Engineered to support a minimum of 250-lb (113-kg) static load when opened.
 3. Mounting: Surface mounted, with unit projecting not more than 4 inches (100 mm) from wall when closed.
 4. Operation: By pneumatic shock-absorbing mechanism.
 5. Material and Finish: HDPE in manufacturer's standard color.
 6. Liner Dispenser: Built in.

2.5 UNDERLAVATORY GUARDS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Plumberex Specialty Products, Inc.
 - 2. Truebro by IPS Corporation.
- B. Underlavatory Guard:
 - 1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
 - 2. Material and Finish: Antimicrobial, molded plastic, white.

2.6 CUSTODIAL ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. A & J Washroom Accessories, Inc.
 - 2. American Specialties, Inc.
 - 3. Bobrick Washroom Equipment, Inc.
 - 4. Bradley Corporation.
 - 5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
 - 6. Tubular Specialties Manufacturing, Inc.
- B. Utility Shelf:
 - 1. Description: With exposed edges turned down not less than 1/2 inch (13 mm) and supported by two triangular brackets welded to shelf underside.
 - 2. Size: 16 inches (406 mm) long by 6 inches (152 mm) deep.
 - 3. Material and Finish: Not less than nominal 0.05-inch- (1.3-mm-) thick stainless steel, No. 4 finish (satin).
- C. Mop and Broom Holder:
 - 1. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
 - 2. Length: 36 inches (914 mm).
 - 3. Hooks: Three.
 - 4. Mop/Broom Holders: Four, spring-loaded, rubber hat, cam type.
 - 5. Material and Finish: Stainless steel, No. 4 finish (satin).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units' level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F 446.

END OF SECTION 102800

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers as shown on Life Safety Plan.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Operation and maintenance data.
- C. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
- C. Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each mounting bracket indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Amerex Corporation.
 - b. Ansul Incorporated; Tyco International Ltd.
 - c. Badger Fire Protection; a Kidde company.
 - d. Buckeye Fire Equipment Company.
 - e. Fire End & Croker Corporation.
 - f. J. L. Industries, Inc.; a division of Activar Construction Products Group.
 - g. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
 - h. Larsen's Manufacturing Company.
 - i. Moon-American.
 - j. Pem All Fire Extinguisher Corp.; a division of PEM Systems, Inc.
 - k. Potter Roemer LLC.
 - l. Pyro-Chem; Tyco Safety Products.
 2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.
- B. Multipurpose Dry-Chemical Type: UL-rated 3A-40B: C nominal capacity, with monoammonium phosphate-based dry chemical in manufacturer's standard enameled container.
- C. Carbon Dioxide Type: UL-rated 5BC capacity, with carbon dioxide in manufacturer's standard enameled-metal container.

2.2 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.
- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
 1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine fire extinguishers for proper charging and tagging.
 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

1. Mounting Brackets: 54 inches (1372 mm) above finished floor to top of fire extinguisher.
- C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 104416

SECTION 105113 - METAL LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Athletic metal lockers.
2. Locker benches.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For metal lockers. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For units with factory-applied color finishes.
- D. Maintenance data.
- E. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements: Where metal lockers and benches are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" and ICC/ANSI A117.1.
- B. Preinstallation Conference: Conduct conference at Project site.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver master and control keys to Owner by registered mail or overnight package service.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
 1. Warranty Period for Knocked-Down Metal Lockers: Two years from date of Substantial Completion.

2. Warranty Period for All-Welded Metal Lockers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with A60 (ZF180) zinc-iron, alloy (galvannealed) coating designation.
- C. Expanded Metal: ASTM F 1267, Type II (flattened), Class I, 3/4-inch (19-mm) steel mesh, with at least 70 percent open area.
- D. Stainless-Steel Sheet: ASTM A 666, Type 304.
- E. Extruded Aluminum: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated.
- F. Steel Tube: ASTM A 500, cold rolled.
- G. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.
- H. Anchors: Material, type, and size required for secure anchorage to each substrate.
 1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls, and elsewhere as indicated, for corrosion resistance.
 2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.2 ATHLETIC METAL LOCKERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 1. All-Welded, Athletic Metal Lockers:
 - a. Art Metal Products; Box Lockers.
 - b. List Industries Inc.; Classmate Lockers.
 - c. Lyon Workspace Products, LLC; All-Welded Expanded Metal Lockers.
 - d. Penco Products, Inc.; All-Welded Lockers.
 - e. Republic Storage Systems Company; All-Welded Ventilated Lockers.
 2. Knocked-Down, Athletic Metal Lockers:
 - a. Art Metal Products; HDV Lockers.
 - b. ASI Storage Solutions Inc.; Competitor Collection.

- c. General Storage Systems Ltd.; Mod-U-Vent II Ventilated Locker.
 - d. Hadrian Manufacturing Inc.; Gladiator Lockers.
 - e. List Industries Inc.; HDV Lockers.
 - f. Lyon Workspace Products, LLC; Expanded Metal Lockers.
 - g. Penco Products, Inc.; Invincible II Lockers.
 - h. Republic Storage Systems Company; Heavy Duty Ventilated Lockers.
 - i. Shanahan's Manufacturing Limited; Pinnacle Lockers.
- B. Locker Arrangement: Box.
- C. Material: Metallic-coated steel sheet.
- D. Body and Shelves: Assembled by welding or riveting or bolting body components together. Fabricate from unperforated steel sheet with 0.048-inch (1.21-mm) nominal-thickness backs and 0.060-inch (1.52-mm) nominal-thickness tops, bottoms, and shelves.
- E. Unperforated Sides: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet.
- F. Perforated Sides: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet with manufacturer's standard diamond perforations.
- G. Expanded-Metal Sides: Fabricated from 0.090-inch (2.28-mm) nominal-thickness expanded metal; welded to 0.105-inch (2.66-mm) nominal-thickness steel angles or 0.060-inch (1.52-mm) nominal-thickness steel channel frames.
- H. Frames: Channel formed; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet or 0.097-inch (2.45-mm) nominal-thickness steel angles; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral door strike full height on vertical main frames.
- I. Reinforced Bottoms: Structural channels, formed from 0.060-inch (1.52-mm) nominal-thickness steel sheet; welded to front and rear of side-panel frames.
- J. Perforated Doors: One piece; fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet with manufacturer's standard diamond perforations; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges and latch point (bottom) and right-angle single bend at remaining edges for box lockers.
- 1. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; welded to inner face of doors.
- K. Expanded-Metal Doors: Fabricated from 0.090-inch (2.28-mm) nominal-thickness expanded metal; welded to 0.105-inch (2.66-mm) nominal-thickness steel angle frame; with 0.090-inch (2.28-mm) nominal-thickness, steel sheet lock panel backed by 0.060-inch (1.52-mm) nominal-thickness steel sheet retainer welded to door frame.
- L. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.

1. Knuckle Hinges: Steel, full loop, five or seven knuckles, tight pin; minimum 2 inches (51 mm) high. Provide no fewer than three hinges for each door more than 42 inches (1067 mm) high.
 2. Continuous Hinges: Manufacturer's standard, steel; side or top mounted as required by locker configuration.
 3. Hinges: Manufacturer's standard, steel, continuous or knuckle type.
- M. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond face of door; pry and vandal resistant.
1. Multipoint Latching: Finger-lift latch control designed for use with built-in combination locks, built-in cylinder locks, or padlocks; positive automatic latching and prelocking.
 - a. Latch Hooks: Equip doors less than 48 inches (1219 mm) high with two latch hooks; fabricated from 0.120-inch (3.04-mm) nominal-thickness steel sheet; welded to full-height door strikes; with resilient silencer on each latch hook.
 - b. Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact and incorporating a prelocking device that allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.
 2. Single-Point Latching: Nonmoving latch hook designed to engage bolt of built-in combination or cylinder lock.
 - a. Latch Hook: Equip each door with one latch hook, fabricated from 0.120-inch (3.04-mm) nominal-thickness steel sheet; welded midway up full-height door strike; with resilient silencer.
- N. Projecting Turn-Handle and Latch: Steel handle welded to manufacturer's standard, three-point, cremone-type latching mechanism consisting of steel rods or bars that engage main locker frame at top and bottom of door, and center latch that engages strike jamb; with steel padlock loop.
- O. Door Handle and Latch for Box Lockers: Stainless-steel strike plate with integral pull; with steel padlock loop that projects through metal locker door.
- P. Cylinder Locks: Built-in, flush, cam locks with five-pin tumbler keyway, keyed separately and master keyed. Furnish two change keys for each lock and two master keys.
1. Key Type: Grooved, with minimum 2- by 2.68-inch (51- by 68.3-mm) key head for accessible lockers.
- Q. Equipment: Equip each metal locker with identification plate and the following unless otherwise indicated:
1. Single-Tier Units: Shelf, one double-prong ceiling hook, and two single-prong wall hooks.
 2. Double-Tier Units: One double-prong ceiling hook and two single-prong wall hooks.
 3. Triple-Tier Units: One double-prong ceiling hook.
- R. Accessories:

1. Legs: 6 inches (152 mm) high; formed by extending vertical frame members or fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet; welded to bottom of locker.
 - a. Closed Front and End Bases: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
 2. Continuous Zee Base: 4 inches (102 mm) high; fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet.
 3. Continuous Sloping Tops: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet, with a pitch of approximately 20 degrees.
 4. Recess Trim: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
 5. Filler Panels: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
 6. Boxed End Panels: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet.
- S. Finish: powder coat.
1. Color(s): As selected by Architect from manufacturer's full range.

2.3 LOCKER BENCHES

- A. Provide bench units with overall assembly height of 17-1/2 inches (445 mm).
- B. Bench Tops: Manufacturer's standard one-piece units, with rounded corners and edges.
 1. Size: Minimum 9-1/2 inches wide by 1-1/4 inches thick (241 mm wide by 32 mm thick except provide minimum 20-inch- (508-mm-) wide tops where accessible benches are indicated.
 2. Laminated clear hardwood with one coat of clear sealer on all surfaces and one coat of clear lacquer on top and sides.
- C. Freestanding Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top, complete with fasteners, and as follows:
 1. Aluminum: 1/8-inch-thick by 3-inch-wide (3-mm-thick by 76-mm-wide) channel or 1/4-inch-thick by 3-inch-wide (6-mm-thick by 76-mm-wide) bar stock, shaped into inverted-T form; with nonskid pads at bottom.
 - a. Finish: Clear anodic finish.

2.4 FABRICATION

- A. Fabricate metal lockers square, rigid, and without warp and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.
 1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
 2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.

- B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.
- C. All-Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds flush.
- D. Accessible Lockers: Fabricate as follows:
 - 1. Locate bottom shelf no lower than 15 inches (381 mm) above the floor.
 - 2. Where hooks, coat rods, or additional shelves are provided, locate no higher than 48 inches (1219 mm) above the floor.
- E. Hooks: Manufacturer's standard ball-pointed type, aluminum or steel; zinc plated.
- F. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high.
- G. Continuous Base: Formed into channel or zee profile for stiffness and fabricated in lengths as long as practical to enclose base and base ends of metal lockers; finished to match lockers.
- H. Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; finished to match lockers.
 - 1. Sloping-top corner fillers, mitered.
- I. Individual Sloping Tops: Fabricated in width to fit one locker frame in lieu of flat locker tops; with integral back; finished to match lockers. Provide wedge-shaped divider panels between lockers.
- J. Recess Trim: Fabricated with minimum 2-1/2-inch (64-mm) face width and in lengths as long as practical; finished to match lockers.
- K. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.
- L. Boxed End Panels: Fabricated with 1-inch- (25-mm-) wide edge dimension and designed for concealing fasteners and holes at exposed ends of nonrecessed metal lockers; finished to match lockers.
- M. Finished End Panels: Designed for concealing unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of nonrecessed metal lockers; finished to match lockers.
- N. Center Dividers: Full-depth, vertical partitions between bottom and shelf; finished to match lockers.

2.5 STEEL SHEET FINISHES

- A. Baked-Enamel Finish: Immediately after cleaning, pretreating, and phosphatizing, apply manufacturer's standard thermosetting baked-enamel finish. Comply with paint manufacturer's written instructions for application, baking, and minimum dry film thickness.
- B. Powder-Coat Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard, baked-polymer, thermosetting powder finish. Comply with resin manufacturer's written instructions for application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install level, plumb, and true; shim as required, using concealed shims.
 - 1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
 - 2. Anchor single rows of metal lockers to walls near top and bottom of lockers of lockers and to floor.
 - 3. Anchor back-to-back metal lockers to floor.
- B. Knocked-Down Metal Lockers: Assemble with standard fasteners, with no exposed fasteners on door faces or face frames.
- C. All-Welded Metal Lockers: Connect groups together with standard fasteners, with no exposed fasteners on face frames.
- D. Equipment and Accessories: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
 - 1. Attach hooks with at least two fasteners.
 - 2. Attach door locks on doors using security-type fasteners.
 - 3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
 - a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
 - 4. Attach recess trim to recessed metal lockers with concealed clips.
 - 5. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
 - 6. Attach sloping-top units to metal lockers, with closures at exposed ends.
 - 7. Attach boxed end panels with concealed fasteners to conceal exposed ends of nonrecessed metal lockers.
 - 8. Attach finished end panels with fasteners only at perimeter to conceal exposed ends of nonrecessed metal lockers.
- E. Freestanding Locker Benches: Place benches in locations indicated on Drawings.

END OF SECTION 105113

SECTION 10530 - EXTRUDED ALUMINUM WALKWAY COVERS

PART I - GENERAL

.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General, Supplementary, and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. The extent of extruded aluminum walkway covers is shown on the Drawings and as specified herein.
- A. Definition: Extruded aluminum walkway cover shall consist entirely of extruded aluminum sections; roll-formed sections are not acceptable. System shall consist of heli-arc welded, one-piece rigid structural bents for column and beam assemblies, decking, fascia, accessory items and hardware to provide a complete system.
- A. Water shall drain from deck into designated beams and out at grade level of columns through weepholes.

1.3 SUBMITTALS

- A. Shop Drawings: Submit detailed shop drawings. Include layout of walkway cover system, bent locations (identify drain columns and wet bents), all mechanical joint locations with complete details, connections, jointing and accessories. Include details of concrete footings and bent anchorage.
- B. Product Data: Submit manufacturer's product data, specifications, component performance data and installation instructions.
- C. Calculations: Provide signed and sealed structural calculations for the walkway covers, by a professional engineer registered in the State of Florida.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the following except as otherwise indicated:
 - 1. AWS (American Welding Society) standards for structural aluminum welding.

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- B. Installer Qualification: Firm with not less than three (3) years experience in installation of aluminum walkway covers of type, quantity and installation methods similar to work of this section.
- B. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to insure proper fitting of work. However, allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay work.
- B. Shop Assembly: Preassemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Coordination: Coordinate work of this Section with work of other sections which interface with covered walkway system (sidewalks, curbs, building fascias, etc.).

1.5 PERFORMANCE REQUIREMENTS:

- A. System Performance: Provide aluminum covered walkway system that has been designed, produced, fabricated and installed to withstand normal temperature changes as well as live loading, dead loading and wind loading in compliance with Standard Building Code requirements for geographic area in which work is located and as follows:
 - 1. Live Load: 30 p.s.f. minimum.
 - 2. Structural design for wind forces: Comply with ASCE 7.
 - 3. Design Wind Velocity: 110 m.p.h.
 - 4. Importance Factor: 1.1.
 - 5. Stability Criteria: Pursuant to Code.
- B. Sizes shown on Drawings shall be considered minimum.
- C. Structure shall be capable of sustaining severe icing, hail, hurricane force winds and supporting a concentrated load such as being walked upon.

1.6 WARRANTY

- A. Warranty: Manufacturer shall warrant the entire system against defects in labor and materials for a period of five (5) years commencing on the date of Substantial Completion. Defects in labor and material may include but is not limited to, one or more of the following:
 - 2. Moisture leaks.
 - 3. Metal failure including excessive deflection
 - 4. Fastener failure
 - 5. Finish failure

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PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: "DITT-Deck Extruded Aluminum Walkway Cover System"; Dittmer Architectural Aluminum.

2.2 MATERIALS

- A. All aluminum extrusions shall be alloy 6063 heat treated to a T-6 temper.
- A. Standard finish for all components shall be satin anodize 204-R1 meeting Aluminum Association Specification AA-M-10C-22A-21.
- A. Fasteners:
 - 2. Deck Screws: Type 18-8 non-magnetic stainless steel sealed with a neoprene "O" ring beneath 5/8" outside dimension, conical washer. Rivets are not permitted.
 - 3. Fascia Rivets: Size 3/16" by 1/2" grip range aluminum rivets with aluminum mandrel.
 - 4. Bolts: All bolts, nuts and washers to be 18-8 non-magnetic stainless steel.
 - 5. Tek Screws: not permitted

2.3 FABRICATION

- A. Comply with indicated profiles, dimensioned requirements and structural requirements.
- B. Use sections true to details with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture, free from defects impairing strength and durability.
- B. All welding do be done by heli-arc process.
- B. Bents shall consist of shop welded one piece units. When size of bents do not permit shipment as a welded unit, concealed mechanical joints may be used.
- B. Mechanical joints shall consist of stainless steel bolts with a minimum of two (2) bolts per fastening. Bolts and nuts shall be installed in a concealed manner utilizing 1/2 inch thick by 1-1/2 inch aluminum bolt bars welded to structural members. All such mechanical joints must be detailed on shop drawings showing all locations.

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- B. Roof Deck: Extruded Aluminum shapes, interlocking self-flashing sections. Shop fabricate to lengths and panels widths required for field assembly. Depth of sections to comply with structural requirements. Provide shop induced camber in deck units with spans greater than 16 feet to offset dead load deflections. Welded dams are to be used at non-draining ends of deck.
- B. Expansion joints, design structure for thermal expansion and contraction. Provide expansion joints as required.
- B. Exposed rivets used to fasten bottom of fascia to deck to have finish to match fascia.
- I. Apply a shop applied dip-coat of clear acrylic enamel to each column end terminating in concrete to insulate from electrolytic reaction. Column ends shall be pierced to "key" grout to bent for maximum uplift protection.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE AND HANDLING:

- A. Deliver, store and handle covered walkway system components as recommended by manufacturer. Handle and store in a manner to avoid deforming members and to avoid excessive stresses.

3.2 EXAMINATION

- A. Examine adjacent work for conditions that would prevent quality installation of system.
- A. Do not proceed until defects are corrected.

3.3 CONCRETE FOOTINGS

- A. Concrete footings are not work of this Section. Refer to Section 03310 "Cast-in-Place Concrete".
- A. Sleeves (extruded polystyrene blockouts) shall be furnished by walkway cover manufacturer and placed by the Contractor.

3.4 FIELD DIMENSIONS

- A. Contractor shall field confirm bent locations, dimensions and elevations shown on shop drawings prior to fabrication.

Extruded Aluminum Walkway Covers 10530-4

3.5 INSTALLATION

- A. Erection: Set roof support frames (bents) into pockets provided in top of footings; set to required elevations, align, plumb and level; and grout in place with 2,000 p.s.i. portland cement grout. Assure that grout fills all voids and "keys" to columns. Fill downspout units with grout to bottom of discharge level. Install aluminum deflectors after grouting. Comply with manufacturer's published instructions. Match to finish and elevation of adjacent sidewalks.
- A. Install roof deck sections, accessories and related flashing in accordance with manufacturer's instructions. Provide roof slope for rain drainage without ponding water. Align and anchor roof deck units to structural support frames.
- A. Assemble all components in a neat, workmanlike manner.

3.6 FLASHING

- A. Flashings: Flashings required between covered walkway system and adjoining structures are not work of this Section. Refer to Section 07610 "Sheet Metal Flashing and Trim".

3.7 CLEANING AND PROTECTION

- A. Damaged Units: Replace roof deck panels and other components of the work which have been damaged or have deteriorated beyond successful minor repair.
- A. Cleaning: Remove protective coverings at time in project construction sequence which will afford greatest protection of work. Clean finished surfaces as recommended by manufacturer. Maintain in a clean condition during construction.
- A. Protection: Advise Contractor of protection and surveillance procedures, as required to ensure that work of this section will be without damage or deterioration at time of Substantial Completion.

END OF SECTION 10530

Extruded Aluminum Walkway Covers 10530-5

SECTION 142100 - ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes electric traction passenger elevators.
- B. See Division 09 Section for finish flooring in elevator cars.

1.2 SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information.
- B. Shop Drawings: Show plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment and signals. Indicate loads imposed on building structure at points of support, and maximum and average power demands.
- C. Samples: For exposed finishes.
- D. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.
- E. Operation and maintenance data.
- F. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with ASME A17.1
- B. Accessibility Requirements: Comply with Section 407, 6th Edition Florida Accessibility Code for Building Construction

1.4 WARRANTY

- A. Special Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair, restore, or replace defective elevator work within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

1.5 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide five years full maintenance service by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Fujitec America, Inc.
 - 2. KONE Inc.
 - 3. Otis Elevator Co.
 - 4. Schindler Elevator Corp.
 - 5. ThyssenKrupp Elevator.
- B. Basis-of-design: Hydro Fit Elevator System by Otis Elevator Company.

2.2 SYSTEMS AND COMPONENTS

- A. General: Provide manufacturer's standard elevator systems, including standard components published by manufacturer as included in standard preengineered elevator systems and as required for complete system.
- B. Elevator Machines: At manufacturer's option, provide either variable-voltage, variable-frequency, ac-type or variable-voltage, dc-type hoisting machines. Provide solid-state power converters.
 - 1. Limit total harmonic distortion of regenerated power to 5 percent per IEEE 519.
 - 2. Provide means for absorbing regenerated power when elevator system is operating on standby power.
- C. Fluid for Oil Buffers: If oil buffers are used, use only fire-resistant hydraulic fluid.
- D. Guides: Provide roller guides or polymer-coated, nonlubricated sliding guides at top and bottom of car and counterweight frames.

2.3 OPERATION SYSTEMS

- A. General: Provide manufacturer's standard microprocessor operation system for each elevator as required to provide type of operation system indicated.
- B. Group Automatic Operation with Demand-Based Dispatching: Provide reprogrammable group automatic system that assigns cars to hall calls based on a dispatching program designed to

minimize passenger waiting time. System automatically adjusts to changes in demand for different traffic conditions including heavy incoming, heavy two-way, heavy outgoing, and light off-hours as variations of normal two-way traffic.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Fujitec America, Inc.; Millennium.
 - b. KONE Inc.; KCM 831.
 - c. Otis Elevator Co.; Elevonic.
 - d. Schindler Elevator Corp.; Miconic TX.
 - e. ThyssenKrupp Elevator; Traflomatic.

C. Single-Car Auxiliary Operations:

1. Standby Power Operation: On activation of standby power, car is returned to a designated floor and parked with doors open. Car can be manually put in service on standby power, either for return operation or for regular operation, by switches in control panel located at main lobby.
2. Battery-Powered Lowering: If power fails and car is at a floor, it remains at that floor, opens its doors, and shuts down. If car is between floors, it is lowered to the next floor below, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.

D. Security Feature: Security feature shall not affect emergency firefighters' service.

2.4 DOOR REOPENING DEVICES

- A. Infrared Array: Provide door reopening devices with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more of the light beams shall cause doors to stop and reopen.
- B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

2.5 FINISH MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel, Type B, pickled.
- C. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.
- D. Stainless-Steel Bars: ASTM A 276, Type 304.
- E. Stainless-Steel Tubing: ASTM A 554, Grade MT 304.
- F. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.

- G. Plastic Laminate: High-pressure type complying with NEMA LD 3, Type HGS or HGL.

2.6 CAR ENCLOSURES

- A. General: Provide steel-framed car enclosures with nonremovable wall panels, with car roof, access doors, power door operators, and ventilation.
 - 1. Provide standard railings complying with ASME A17.1 on car tops where required by ASME A17.1.
 - 2. Enameled-Steel Wall Panels: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
 - 3. Stainless-Steel Wall Panels: Flush, hollow-metal construction.
 - 4. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to manufacturer's standard core with manufacturer's standard protective edge trim. Plastic-laminate color, texture, and pattern as selected by Architect from elevator manufacturer's full range.
 - 5. Enameled-Steel Doors: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
 - 6. Stainless-Steel Doors: Flush, hollow-metal construction.
 - 7. Plastic-Laminate Doors: Flush, hollow-metal construction; fabricated by laminating plastic laminate to exposed faces of enameled cold-rolled steel doors and covering edges with protective edge trim. Plastic-laminate color, texture, and pattern as selected by Architect from elevator manufacturer's full range.
 - 8. Sills: Extruded aluminum, with grooved surface, 1/4 inch (6.4 mm) thick.
 - 9. Luminous Ceiling: Fluorescent light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic.

2.7 HOISTWAY ENTRANCES

- A. General: Provide manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories.
 - 1. Where gypsum board wall construction is indicated, provide self-supporting frames with reinforced head sections.
- B. Materials and Fabrication: Provide manufacturer's standards, but not less than the following:
 - 1. Enameled-Steel Frames: Formed from cold-rolled or hot-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
 - 2. Stainless-Steel Frames: Formed from stainless-steel sheet.
 - 3. Enameled-Steel Doors: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
 - 4. Sills: Extruded aluminum, with grooved surface, 1/4 inch (6.4 mm) thick.
 - 5. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

2.8 SIGNAL EQUIPMENT

- A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with LEDs.
- B. Car Control Stations: Provide manufacturer's standard car control stations. Mount in return panel adjacent to car door, unless otherwise indicated.
- C. Emergency Communication System: Provide system that complies with ASME A17.1 and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)." On activation, system dials preprogrammed number of monitoring station and identifies elevator location to monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring station has responded. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.
- D. Firefighters' Two-Way Telephone Communication Service: Provide telephone jack in each car and required conductors in traveling cable for firefighters' two-way telephone communication service specified in Division 28 Section "Fire Detection and Alarm."
- E. Car Position Indicator: Provide illuminated, digital-type car position indicator, located above car door or above car control station. Also provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served.
 - 1. Include travel direction arrows if not provided in car control station.
- F. Hall Push-Button Stations: Provide hall push-button stations at each landing as indicated.
- G. Hall Lanterns: Units with illuminated arrows.
 - 1. Manufacturer's standard wall-mounted units, for mounting above entrance frames.
 - 2. Units mounted in both jambs of entrance frame.
- H. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
- I. Corridor Call Station Pictograph Signs: Provide signs matching hall push-button stations, with text and graphics as required by authorities having jurisdiction.

2.9 ELEVATORS

- A. Elevator Description:
 - 1. Machine Location: Hoistway; no machine room is provided.
 - 2. Rated Load: 2500 lb (1135 kg).
 - 3. Rated Speed: 200 fpm (1.0 m/s).
 - 4. Car Enclosures:
 - a. Inside Width: 80 inches (2032 mm) from side wall to side wall.

- b. Inside Depth: 51 inches (1295 mm) from back wall to front wall (return panels).
 - c. Inside Height: 88 inches (2235 mm) to underside of ceiling.
 - d. Front Walls (Return Panels): Satin stainless steel, No. 4 finish.
 - e. Car Fixtures: Satin stainless steel, No. 4 finish.
 - f. Side and Rear Wall Panels: Plastic laminate.
 - g. Door Faces (Interior): Enameled steel.
 - h. Handrails: 1/2 by 2 inches (13 by 50 mm) rectangular satin stainless steel, No. 4 finish, at sides and rear of car.
 - i. Floor prepared to receive sheet vinyl (specified in Division 09 Section "Resilient Sheet Flooring").
5. Hoistway Entrances: As follows:
- a. Width: 42 inches (1067 mm).
 - b. Height: 84 inches (2134 mm).
 - c. Type: Single-speed side sliding.
 - d. Fire-Protection Rating: 1 hour.
 - e. Frames at First Floor Satin stainless steel, No. 4 finish.
 - f. Doors at First Floor at Other Floors: Enameled steel.
6. Hall Fixtures at First Floor at Other Floors: Polished Satin stainless steel, No. 4 finish.
7. Additional Requirements:
- a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, No. 4 finish.
 - b. Provide blanket hooks in all cars and one complete set(s) of full-height protective blankets.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts designed to minimize transmission of vibrations to structure and thereby minimize structure-borne noise from elevator system.
- B. Leveling Tolerance: 1/8 inch (3 mm), up or down, regardless of load and direction of travel.
- C. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

3.2 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.

3.3 PROTECTION

- A. Temporary Use: Limit temporary use for construction purposes to one elevator. Comply with the following requirements for each elevator used for construction purposes:
 - 1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.
 - 2. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
 - 3. Engage elevator Installer to provide full maintenance service.
 - 4. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate, adjust, and maintain elevator(s). Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 142100

SECTION 220517 - SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Stack-sleeve fittings.
 - 3. Sleeve-seal systems.
 - 4. Sleeve-seal fittings.
 - 5. Grout.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.
- C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
- D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- F. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.
- G. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

2.2 STACK-SLEEVE FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Smith, Jay R. Mfg. Co.
 2. Zurn Industries, LLC.
- B. Description: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring, bolts, and nuts for membrane flashing.
1. Underdeck Clamp: Clamping ring with setscrews.

2.3 SLEEVE-SEAL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Products & Systems, Inc.
 2. CALPICO, Inc.
 3. GPT; an EnPro Industries company.
 4. Metraflex Company (The).
 5. Proco Products, Inc.
- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 2. Pressure Plates: Carbon steel.
 3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.4 SLEEVE-SEAL FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Products & Systems, Inc.
 2. CALPICO, Inc.
 3. GPT; an EnPro Industries company.
 4. Metraflex Company (The).
 5. Proco Products, Inc.

- B. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall. Unit has plastic or rubber waterstop collar with center opening to match piping OD.

2.5 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
 - 1. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 - 1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
 - 2. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
 - 3. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 079200 "Joint Sealants."
- E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.2 STACK-SLEEVE-FITTING INSTALLATION

- A. Install stack-sleeve fittings in new slabs as slabs are constructed.
 - 1. Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 2. Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing. Comply with requirements for flashing specified in Section 076200 "Sheet Metal Flashing and Trim."
 - 3. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
 - 4. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
 - 5. Using grout, seal the space around outside of stack-sleeve fittings.
- B. Fire-Barrier Penetrations: Maintain indicated fire rating of floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.3 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.4 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

3.5 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
 - 1. Exterior Concrete Walls above Grade:
 - a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
 - b. Piping NPS 6 and Larger: Galvanized-steel-pipe sleeves.
 - 2. Exterior Concrete Walls below Grade:

- a. Piping Smaller Than NPS 6: Galvanized-steel wall sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
 - b. Piping NPS 6 and Larger: Galvanized-steel wall sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
3. Concrete Slabs-on-Grade:
- a. Piping Smaller Than NPS 6: Galvanized-steel wall sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
 - b. Piping NPS 6 and Larger: Galvanized-steel wall sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
4. Interior Partitions:
- a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
 - b. Piping NPS 6 and Larger: Galvanized-steel-sheet sleeves.

END OF SECTION 220517

SECTION 220518 - ESCUTCHEONS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.
 - 2. Floor plates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
- C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.
- D. Split-Casting Brass Type: With polished, chrome-plated finish and with concealed hinge and setscrew.
- E. Split-Plate, Stamped-Steel Type: With chrome-plated finish, concealed hinge, and spring-clip fasteners.

2.2 FLOOR PLATES

- A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
- B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of insulated piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - g. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - h. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - i. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - j. Bare Piping in Equipment Rooms: One-piece, cast-brass or split-casting brass type with polished, chrome-plated finish.
 - k. Bare Piping in Equipment Rooms: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. New Piping: One-piece, floor-plate type.
 - 2. Existing Piping: Split-casting, floor-plate type.

3.2 FIELD QUALITY CONTROL

- A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 220518

SECTION 220519 - METERS AND GAGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Bimetallic-actuated thermometers.
2. Filled-system thermometers.
3. Liquid-in-glass thermometers.
4. Light-activated thermometers.
5. Thermowells.
6. Dial-type pressure gages.
7. Gage attachments.
8. Test plugs.
9. Test-plug kits.
10. Sight flow indicators.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of meter and gage, from manufacturer.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For meters and gages to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 BIMETALLIC-ACTUATED THERMOMETERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the

following:

1. Ashcroft Inc.
2. Ernst Flow Industries.
3. Marsh Bellofram.
4. Miljoco Corporation.
5. Nanmac Corporation.
6. Noshok.
7. Palmer Wahl Instrumentation Group.
8. REOTEMP Instrument Corporation.
9. Tel-Tru Manufacturing Company.
10. Trerice, H. O. Co.
11. WATTS.
12. Weiss Instruments, Inc.
13. Weksler Glass Thermometer Corp.
14. WIKA Instrument Corporation.
15. Winters Instruments - U.S.

- B. Standard: ASME B40.200.
- C. Case: Liquid-filled and sealed type(s); stainless steel with 5-inch nominal diameter.
- D. Dial: Nonreflective aluminum with permanently etched scale markings and scales in deg F.
- E. Connector Type(s): Union joint, adjustable angle, with unified-inch screw threads.
- F. Connector Size: 1/2 inch, with ASME B1.1 screw threads.
- G. Stem: 0.25 or 0.375 inch in diameter; stainless steel.
- H. Window: Plain glass.
- I. Ring: Stainless steel.
- J. Element: Bimetal coil.
- K. Pointer: Dark-colored metal.
- L. Accuracy: Plus or minus 1 percent of scale range.

2.2 FILLED-SYSTEM THERMOMETERS

A. Direct-Mounted, Metal-Case, Vapor-Actuated Thermometers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ashcroft Inc.
 - b. Marsh Bellofram.
 - c. Miljoco Corporation.

- d. Palmer Wahl Instrumentation Group.
 - e. REOTEMP Instrument Corporation.
 - f. Trerice, H. O. Co.
 - g. Weiss Instruments, Inc.
2. Standard: ASME B40.200.
3. Case: Sealed type, drawn steel; 5-inch nominal diameter.
4. Element: Bourdon tube or other type of pressure element.
5. Movement: Mechanical, with link to pressure element and connection to pointer.
6. Dial: Nonreflective aluminum with permanently etched scale markings graduated in deg F.
7. Pointer: Dark-colored metal.
8. Window: Glass.
9. Ring: Stainless steel.
10. Connector Type(s): Union joint, 360 degrees in horizontal plane, with locking device; with ASME B1.1 screw threads.
11. Thermal System: Liquid-filled bulb in copper-plated steel, aluminum, or brass stem and of length to suit installation.
- a. Design for Thermowell Installation: Bare stem.
12. Accuracy: Plus or minus percent of scale range.

2.3 LIQUID-IN-GLASS THERMOMETERS

A. Metal-Case, Industrial-Style, Liquid-in-Glass Thermometers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. Flo Fab Inc.
 - b. Miljoco Corporation.
 - c. Palmer Wahl Instrumentation Group.
 - d. Tel-Tru Manufacturing Company.
 - e. Trerice, H. O. Co.
 - f. Weiss Instruments, Inc.
 - g. Weksler Glass Thermometer Corp.
 - h. Winters Instruments – U.S.
2. Standard: ASME B40.200.
3. Case: Cast aluminum; 7-inch nominal size unless otherwise indicated.
4. Case Form: Back angle unless otherwise indicated.
5. Tube: Glass with magnifying lens and blue or red organic liquid.
6. Tube Background: Nonreflective aluminum with permanently etched scale markings graduated in deg F.
7. Window: Glass.
8. Stem: Aluminum and of length to suit installation.

- a. Design for Thermowell Installation: Bare stem.
- 9. Connector: 1-1/4 inches, with ASME B1.1 screw threads.
- 10. Accuracy: Plus or minus 1 percent of scale range or one scale division, to a maximum of 1.5 percent of scale range.

2.4 LIGHT-ACTIVATED THERMOMETERS

A. Direct-Mounted, Light-Activated Thermometers:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Flo Fab Inc.
 - b. REOTEMP Instrument Corporation.
 - c. Terice, H. O. Co.
 - d. Weiss Instruments, Inc.
 - e. Weksler Glass Thermometer Corp.
 - f. WIKA Instrument Corporation.
 - g. Winters Instruments - U.S.
- 2. Case: Metal; 7-inch nominal size unless otherwise indicated.
- 3. Scale(s): Deg F.
- 4. Case Form: Adjustable angle.
- 5. Connector: 1-1/4 inches, with ASME B1.1 screw threads.
- 6. Stem: Aluminum and of length to suit installation.
 - a. Design for Thermowell Installation: Bare stem.
- 7. Display: Digital.
- 8. Accuracy: Plus or minus 2 deg F.

2.5 THERMOWELLS

A. Thermowells:

- 1. Standard: ASME B40.200.
- 2. Description: Pressure-tight, socket-type fitting made for insertion into piping tee fitting.
- 3. Material for Use with Copper Tubing: CNR or CUNI.
- 4. Material for Use with Steel Piping: CSA.
- 5. Type: Stepped shank unless straight or tapered shank is indicated.
- 6. External Threads: NPS 1/2, NPS 3/4, or NPS 1, ASME B1.20.1 pipe threads.
- 7. Internal Threads: 1/2, 3/4, and 1 inch, with ASME B1.1 screw threads.
- 8. Bore: Diameter required to match thermometer bulb or stem.
- 9. Insertion Length: Length required to match thermometer bulb or stem.
- 10. Lagging Extension: Include on thermowells for insulated piping and tubing.

11. Bushings: For converting size of thermowell's internal screw thread to size of thermometer connection.

B. Heat-Transfer Medium: Mixture of graphite and glycerin.

2.6 PRESSURE GAGES

A. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ametek U.S. Gauge.
 - b. Ashcroft Inc.
 - c. Ernst Flow Industries.
 - d. Flo Fab Inc.
 - e. Marsh Bellofram.
 - f. Miljoco Corporation.
 - g. Noshok.
 - h. Palmer Wahl Instrumentation Group.
 - i. REOTEMP Instrument Corporation.
 - j. Tel-Tru Manufacturing Company.
 - k. Terice, H. O. Co.
 - l. WATTS.
 - m. Weiss Instruments, Inc.
 - n. Weksler Glass Thermometer Corp.
 - o. WIKA Instrument Corporation.
 - p. Winters Instruments - U.S.
2. Standard: ASME B40.100.
3. Case: Liquid-filled type(s); cast aluminum or drawn steel; 4-1/2-inch nominal diameter.
4. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.
5. Pressure Connection: Brass, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.
6. Movement: Mechanical, with link to pressure element and connection to pointer.
7. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi and kPa.
8. Pointer: Dark-colored metal.
9. Window: Glass.
10. Ring: Metal.
11. Accuracy: Grade A, plus or minus 1 percent of middle half of scale range.

B. Direct-Mounted, Plastic-Case, Dial-Type Pressure Gages:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Ametek U.S. Gauge.
 - b. Ashcroft Inc.
 - c. Flo Fab Inc.
 - d. Marsh Bellofram.
 - e. Miljoco Corporation.
 - f. Noshok.
 - g. Palmer Wahl Instrumentation Group.
 - h. REOTEMP Instrument Corporation.
 - i. Tel-Tru Manufacturing Company.
 - j. Trerice, H. O. Co.
 - k. Weiss Instruments, Inc.
 - l. Weksler Glass Thermometer Corp.
 - m. WIKA Instrument Corporation.
 - n. Winters Instruments - U.S.
2. Standard: ASME B40.100.
 3. Case: Sealed type; plastic; 4-1/2-inch nominal diameter.
 4. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.
 5. Pressure Connection: Brass, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.
 6. Movement: Mechanical, with link to pressure element and connection to pointer.
 7. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi and kPa.
 8. Pointer: Dark-colored metal.
 9. Window: Glass.
 10. Accuracy: Grade A, plus or minus 1 percent of middle half of scale range.

2.7 GAGE ATTACHMENTS

- A. Snubbers: ASME B40.100, brass; with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and piston or porous-metal-type surge-dampening device. Include extension for use on insulated piping.
- B. Valves: Brass or stainless-steel needle, with NPS 1/4 or NPS 1/2 ASME B1.20.1 pipe threads.

2.8 TEST PLUGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Flow Design, Inc.
 2. Miljoco Corporation.
 3. Nexus Valve, Inc.
 4. Peterson Equipment Co., Inc.
 5. Sisco Manufacturing Company, Inc.
 6. Trerice, H. O. Co.
 7. WATTS.

8. Weiss Instruments, Inc.
9. Weksler Glass Thermometer Corp.

- B. Description: Test-station fitting made for insertion into piping tee fitting.
- C. Body: Brass or stainless steel with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.
- D. Thread Size: NPS 1/4, ASME B1.20.1 pipe thread.
- E. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F.
- F. Core Inserts: EPDM self-sealing rubber.

2.9 TEST-PLUG KITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Flow Design, Inc.
 2. Miljoco Corporation.
 3. Nexus Valve, Inc.
 4. Peterson Equipment Co., Inc.
 5. Sisco Manufacturing Company, Inc.
 6. Trerice, H. O. Co.
 7. WATTS.
 8. Weiss Instruments, Inc.
- B. Furnish one test-plug kit containing one thermometer, one pressure gage and adapter, and carrying case. Thermometer sensing elements, pressure gage, and adapter probes shall be of diameter to fit test plugs and of length to project into piping.
- C. Low-Range Thermometer: Small, bimetallic insertion type with 1- to 2-inch-diameter dial and tapered-end sensing element. Dial range shall be at least 25 to 125 deg F.
- D. High-Range Thermometer: Small, bimetallic insertion type with 1- to 2-inch- diameter dial and tapered-end sensing element. Dial range shall be at least 0 to 220 deg F.
- E. Pressure Gage: Small, Bourdon-tube insertion type with 2- to 3-inch- diameter dial and probe. Dial range shall be at least 0 to 200 psig.
- F. Carrying Case: Metal or plastic, with formed instrument padding.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install thermowells with socket extending to center of pipe and in vertical position in piping tees.

- B. Install thermowells of sizes required to match thermometer connectors. Include bushings if required to match sizes.
- C. Install thermowells with extension on insulated piping.
- D. Fill thermowells with heat-transfer medium.
- E. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.
- F. Install direct-mounted pressure gages in piping tees with pressure gage located on pipe at the most readable position.
- G. Install valve and snubber in piping for each pressure gage for fluids.
- H. Install test plugs in piping tees.
- I. Install thermometers in the following locations:
 - 1. Inlet and outlet of each water heater.
- J. Install pressure gages in the following locations:
 - 1. Building water service entrance into building.
 - 2. Inlet and outlet of each pressure-reducing valve.
 - 3. Suction and discharge of each domestic water pump.

3.2 CONNECTIONS

- A. Install meters and gages adjacent to machines and equipment to allow service and maintenance of meters, gages, machines, and equipment.

3.3 ADJUSTING

- A. Adjust faces of meters and gages to proper angle for best visibility.

3.4 THERMOMETER SCHEDULE

- A. Thermometers at inlet and outlet of each domestic water heater shall be one of the following:
 - 1. Liquid-filled, bimetallic-actuated type.
 - 2. Direct-mounted, metal-case, vapor-actuated type.
 - 3. Industrial-style, liquid-in-glass type.
 - 4. Direct-mounted, light-activated type.
 - 5. Test plug with EPDM self-sealing rubber inserts.
- B. Thermometer stems shall be of length to match thermowell insertion length.

3.5 THERMOMETER SCALE-RANGE SCHEDULE

- A. Scale Range for Domestic Cold-Water Piping: 0 to 150 deg F.
- B. Scale Range for Domestic Hot-Water Piping: 0 to 250 deg F.

3.6 PRESSURE-GAGE SCHEDULE

- A. Pressure gages at discharge of each water service into building shall be one of the following:
 - 1. Liquid-filled, direct-mounted, metal case.
 - 2. Sealed, direct-mounted, plastic case.
 - 3. Test plug with EPDM self-sealing rubber inserts.
- B. Pressure gages at inlet and outlet of each water pressure-reducing valve shall be one of the following:
 - 1. Liquid-filled, direct-mounted, metal case.
 - 2. Sealed, direct-mounted, plastic case.
 - 3. Test plug with EPDM self-sealing rubber inserts.
- C. Pressure gages at suction and discharge of each domestic water pump shall be one of the following:
 - 1. Liquid-filled, direct-mounted, metal case.
 - 2. Sealed, direct-mounted, plastic case.
 - 3. Test plug with EPDM self-sealing rubber inserts.

3.7 PRESSURE-GAGE SCALE-RANGE SCHEDULE

- A. Scale Range for Domestic Water Piping: 0 to 160 psi.

END OF SECTION 220519

SECTION 220523.12 - BALL VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Brass ball valves.
2. Bronze ball valves.
3. Steel ball valves.
4. Iron ball valves.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of valve.
 1. Certification that products comply with NSF 61 Annex G.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 1. Protect internal parts against rust and corrosion.
 2. Protect threads, flange faces, and soldered ends.
 3. Set ball valves open to minimize exposure of functional surfaces.
- B. Use the following precautions during storage:
 1. Maintain valve end protection.
 2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B1.20.1 for threads for threaded end valves.
 - 2. ASME B16.1 for flanges on iron valves.
 - 3. ASME B16.5 for flanges on steel valves.
 - 4. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 5. ASME B16.18 for solder-joint connections.
 - 6. ASME B31.9 for building services piping valves.
- C. NSF Compliance: NSF 61 Annex G for valve materials for potable-water service.
- D. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
- E. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- F. Valve Sizes: Same as upstream piping unless otherwise indicated.
- G. Valve Actuator Types:
 - 1. Gear Actuator: For quarter-turn valves NPS 4 and larger.
 - 2. Handlever: For quarter-turn valves smaller than NPS 4.
- H. Valves in Insulated Piping:
 - 1. Include 2-inch stem extensions.
 - 2. Extended operating handles of nonthermal-conductive material and protective sleeves that allow operation of valves without breaking vapor seals or disturbing insulation.
 - 3. Memory stops that are fully adjustable after insulation is applied.

2.2 BRASS BALL VALVES

- A. One-Piece, Brass Ball Valves:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. KITZ Corporation.
 - 2. Description:
 - a. Standard: MSS SP-110.

- b. CWP Rating: 400 psig.
- c. Body Design: One piece.
- d. Body Material: Forged brass or bronze.
- e. Ends: Threaded and soldered.
- f. Seats: PTFE.
- g. Stem: Brass or stainless steel.
- h. Ball: Chrome-plated brass or stainless steel.
- i. Port: Reduced.

B. Two-Piece, Brass Ball Valves with Full Port and Stainless-Steel Trim:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. Hammond Valve.
 - c. Jomar Valve.
 - d. KITZ Corporation.
 - e. Marwin Valve; Richards Industries.
 - f. Milwaukee Valve Company.
 - g. NIBCO INC.
- 2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Two piece.
 - d. Body Material: Forged brass.
 - e. Ends: Threaded and soldered.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

C. Two-Piece, Brass Ball Valves with Regular Port and Stainless-Steel Trim:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Jamesbury; Metso.
- 2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Two piece.
 - d. Body Material: Brass or bronze.
 - e. Ends: Threaded and soldered.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.

- i. Port: Regular.

D. Three-Piece, Brass Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Marwin Valve; Richards Industries.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Three piece.
 - d. Body Material: Forged brass.
 - e. Ends: Threaded and soldered.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

2.3 BRONZE BALL VALVES

A. One-Piece, Bronze Ball Valves with Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. NIBCO INC.
 - c. WATTS.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: One piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Reduced.

B. Two-Piece, Bronze Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. Crane; a Crane brand.
 - c. FNW; Ferguson Enterprises, Inc.
 - d. Hammond Valve.
 - e. Lance Valves.
 - f. Milwaukee Valve Company.
 - g. NIBCO INC.
 - h. WATTS.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Two piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded or soldered.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

C. Two-Piece, Bronze Ball Valves with Regular Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. Hammond Valve.
 - c. NIBCO INC.
 - d. Stockham; a Crane brand.
 - e. WATTS.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Two piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Regular.

D. Three-Piece, Bronze Ball Valves with Full Port and Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. Hammond Valve.
 - c. Milwaukee Valve Company.
 - d. NIBCO INC.
 - e. WATTS.
2. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig.
 - c. Body Design: Three piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

2.4 STEEL BALL VALVES

A. Class 150, Steel Ball Valves with Full Port:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. FNW; Ferguson Enterprises, Inc.
 - c. Jamesbury; Metso.
 - d. NIBCO INC.
2. Description:
 - a. Standard: MSS SP-72.
 - b. CWP Rating: 285 psig.
 - c. Body Design: Split body.
 - d. Body Material: Carbon steel, ASTM A 216, Type WCB.
 - e. Ends: Flanged or threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

2.5 IRON BALL VALVES

A. Class 125, Iron Ball Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Valve, Inc.
 - b. Apollo Flow Controls; Conbraco Industries, Inc.
 - c. KITZ Corporation.
 - d. Sure Flow Equipment Inc.
 - e. WATTS.
 - f. Zurn Industries, LLC.
2. Description:
 - a. Standard: MSS SP-72.
 - b. CWP Rating: 200 psig.
 - c. Body Design: Split body.
 - d. Body Material: ASTM A 126, gray iron.
 - e. Ends: Flanged or threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel.
 - i. Port: Full.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.

- D. Install valves in position to allow full stem movement.
- E. Install valve tags. Comply with requirements in Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

3.3 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valves with specified CWP ratings are unavailable, the same types of valves with higher CWP ratings may be substituted.
- B. Select valves with the following end connections:
 - 1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 - 2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 3. For Copper Tubing, NPS 5 and Larger: Flanged ends.
 - 4. For Steel Piping, NPS 2 and Smaller: Threaded ends.
 - 5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 6. For Steel Piping, NPS 5 and Larger: Flanged ends.

3.4 DOMESTIC HOT- AND COLD-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller:
 - 1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
 - 2. One piece, brass ball valve.
 - 3. One piece, bronze ball valve with stainless-steel trim.
 - 4. Two-piece, brass ball valves with full or regular port and stainless-steel trim.
 - 5. Two-piece, bronze ball valves with full port and stainless-steel trim.
 - 6. Three-piece, brass ball valves with full port and stainless-steel trim.
 - 7. Three-piece, bronze ball valves with full port and stainless-steel trim.
 - 8. Two-piece, bronze ball valves with regular port and stainless-steel trim.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. Steel and Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
 - 2. Class 150, steel ball valves with full port.
 - 3. Class 150, iron ball valves.

END OF SECTION 220523.12

SECTION 220523.14 - CHECK VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Bronze swing check valves.
 - 2. Iron swing check valves.
 - 3. Iron swing check valves with closure control.
 - 4. Iron, grooved-end swing check valves.
 - 5. Iron, center-guided check valves.
 - 6. Iron, plate-type check valves.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene-diene terpolymer rubber.
- C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of valve.
 - 1. Certification that products comply with NSF 61 Annex G.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, grooves, and weld ends.
 - 3. Set check valves in either closed or open position.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.

2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 1. ASME B1.20.1 for threads for threaded end valves.
 2. ASME B16.1 for flanges on iron valves.
 3. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 4. ASME B16.18 for solder joint.
 5. ASME B31.9 for building services piping valves.
- C. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.
- D. NSF Compliance: NSF 61 Annex G for valve materials for potable-water service.
- E. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
- F. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- G. Valve Sizes: Same as upstream piping unless otherwise indicated.
- H. Valve Bypass and Drain Connections: MSS SP-45.

2.2 BRONZE SWING CHECK VALVES

- A. Class 125, Bronze, Swing Check Valves with Bronze Disc:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Valve, Inc.
 - b. Apollo Flow Controls; Conbraco Industries, Inc.
 - c. Crane; a Crane brand.
 - d. Hammond Valve.
 - e. Jenkins Valves; a Crane brand.
 - f. KITZ Corporation.
 - g. Macomb Groups (The).

- h. Milwaukee Valve Company.
- i. NIBCO INC.
- j. Powell Valves.
- k. Red-White Valve Corp.
- l. Stockham; a Crane brand.
- m. WATTS.

2. Description:

- a. Standard: MSS SP-80, Type 3.
- b. CWP Rating: 200 psig.
- c. Body Design: Horizontal flow.
- d. Body Material: ASTM B 62, bronze.
- e. Ends: Threaded or soldered. See valve schedule articles.
- f. Disc: Bronze.

B. Class 150, Bronze Swing Check Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Crane; a Crane brand.
- b. FNW; Ferguson Enterprises, Inc.
- c. Hammond Valve.
- d. Jenkins Valves; a Crane brand.
- e. Milwaukee Valve Company.
- f. NIBCO INC.
- g. WATTS.

2. Description:

- a. Standard: MSS SP-80, Type 4.
- b. CWP Rating: 300 psig.
- c. Body Design: Horizontal flow.
- d. Body Material: ASTM B 62, bronze.
- e. Ends: Threaded or soldered. See valve schedule articles.
- f. Disc: PTFE.

2.3 IRON SWING CHECK VALVES

A. Class 125, Iron Swing Check Valves with Metal Seats:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Apollo Flow Controls; Conbraco Industries, Inc.
- b. Crane; a Crane brand.
- c. FNW; Ferguson Enterprises, Inc.
- d. Hammond Valve.
- e. Jenkins Valves; a Crane brand.

- f. KITZ Corporation.
- g. Legend Valve & Fitting, Inc.
- h. Macomb Groups (The).
- i. Milwaukee Valve Company.
- j. NIBCO INC.
- k. Powell Valves.
- l. Red-White Valve Corp.
- m. Stockham; a Crane brand.
- n. Sure Flow Equipment Inc.
- o. WATTS.

2. Description:

- a. Standard: MSS SP-71, Type I.
- b. CWP Rating: 200 psig.
- c. Body Design: Clear or full waterway.
- d. Body Material: ASTM A 126, gray iron with bolted bonnet.
- e. Ends: Flanged or threaded. See valve schedule articles.
- f. Trim: Bronze.
- g. Gasket: Asbestos free.

2.4 IRON SWING CHECK VALVES WITH CLOSURE CONTROL

A. Class 125, Iron Swing Check Valves with Lever- and Spring-Closure Control:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Crane; a Crane brand.
- b. Hammond Valve.
- c. Jenkins Valves; a Crane brand.
- d. Milwaukee Valve Company.
- e. NIBCO INC.
- f. Stockham; a Crane brand.
- g. WATTS.

2. Description:

- a. Standard: MSS SP-71, Type I.
- b. CWP Rating: 200 psig.
- c. Body Design: Clear or full waterway.
- d. Body Material: ASTM A 126, gray iron with bolted bonnet.
- e. Ends: Flanged or threaded. See valve schedule articles.
- f. Trim: Bronze.
- g. Gasket: Asbestos free.
- h. Closure Control: Factory-installed exterior lever and weight.

2.5 IRON, GROOVED-END SWING CHECK VALVES

A. 300 CWP, Iron, Grooved-End Swing Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. Shurjoint-Apollo Piping Products USA Inc.
 - c. Tyco by Johnson Controls Company.
 - d. Victaulic Company.
2. Description:
 - a. CWP Rating: 300 psig.
 - b. Body Material: ASTM A 536, ductile iron.
 - c. Seal: EPDM.
 - d. Disc: Spring operated, ductile iron or stainless steel.

2.6 IRON, CENTER-GUIDED, SPRING-LOADED CHECK VALVES

A. Class 125, Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. APCO Willamette Valve and Primer Corporation.
 - c. Crispin Valve.
 - d. DFT Inc.
 - e. Flo Fab Inc.
 - f. FNW; Ferguson Enterprises, Inc.
 - g. GA Industries, Inc.
 - h. Hammond Valve.
 - i. Metraflex Company (The).
 - j. Milwaukee Valve Company.
 - k. Mueller Steam Specialty; A WATTS Brand.
 - l. NIBCO INC.
 - m. Spence Strainers International.
 - n. Sure Flow Equipment Inc.
 - o. Val-Matic Valve & Manufacturing Corp.
 - p. WATTS.
2. Description:
 - a. Standard: MSS SP-125.
 - b. CWP Rating: 200 psig.
 - c. Body Material: ASTM A 126, gray iron.
 - d. Style: Compact wafer, spring loaded.
 - e. Seat: Bronze.

B. Class 125, Iron, Globe, Center-Guided Check Valves with Metal Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. DFT Inc.
 - d. Flomatic Corporation.
 - e. Hammond Valve.
 - f. Metraflex Company (The).
 - g. Milwaukee Valve Company.
 - h. Mueller Steam Specialty; A WATTS Brand.
 - i. NIBCO INC.
 - j. Spence Strainers International.
 - k. Sure Flow Equipment Inc.
 - l. Val-Matic Valve & Manufacturing Corp.
 - m. WATTS.
2. Description:
 - a. Standard: MSS SP-125.
 - b. CWP Rating: 200 psig.
 - c. Body Material: ASTM A 126, gray iron.
 - d. Style: Globe, spring loaded.
 - e. Ends: Flanged.
 - f. Seat: Bronze.

C. Class 125, Iron, Compact-Wafer, Center-Guided Check Valves with Resilient Seat:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Apollo Flow Controls; Conbraco Industries, Inc.
 - c. Crispin Valve.
 - d. DFT Inc.
 - e. Flo Fab Inc.
 - f. Hammond Valve.
 - g. Milwaukee Valve Company.
 - h. NIBCO INC.
 - i. Spence Strainers International.
 - j. Sure Flow Equipment Inc.
 - k. Val-Matic Valve & Manufacturing Corp.
2. Description:
 - a. Standard: MSS SP-125.
 - b. CWP Rating: 200 psig.
 - c. Body Material: ASTM A 126, gray iron.
 - d. Style: Compact wafer, spring loaded.

- e. Seat: EPDM.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.
- E. Install check valves for proper direction of flow and as follows:
 - 1. Swing Check Valves: In horizontal position with hinge pin level.
 - 2. Center-Guided and Plate-Type Check Valves: In horizontal or vertical position, between flanges.
 - 3. Lift Check Valves: With stem upright and plumb.
- F. Install valve tags. Comply with requirements in Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

3.3 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valve applications are not indicated, use the following:
 - 1. Pump-Discharge Check Valves:
 - a. NPS 2 and Smaller: Bronze swing check valves with bronze or nonmetallic disc.
 - b. NPS 2-1/2 and Larger for Domestic Water: Iron swing check valves with lever and weight or spring; or iron, center-guided, metal-seat or resilient-seat check valves.
 - c. NPS 2-1/2 and Larger for Sanitary Waste and Storm Drainage: Iron swing check valves with lever and weight or spring.
- B. If valves with specified CWP ratings are unavailable, the same types of valves with higher CWP ratings may be substituted.
- C. End Connections:
 - 1. For Copper Tubing, NPS 2 and Smaller: Threaded or soldered.
 - 2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged or threaded.
 - 3. For Copper Tubing, NPS 5 and Larger: Flanged.
 - 4. For Steel Piping, NPS 2 and Smaller: Threaded.
 - 5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged or threaded.
 - 6. For Steel Piping, NPS 5 and Larger: Flanged.
 - 7. For Grooved-End Copper Tubing and Steel Piping: Grooved.

3.5 DOMESTIC HOT- AND COLD-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller: Bronze swing check valves, Class 150, bronze disc with soldered or threaded end connections.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. Iron swing check valves, Class 125, metal seats with threaded or flanged end connections.
 - 2. Iron swing check valves with closure control, Class 125, lever and spring with threaded or flanged end connections.
 - 3. Iron, grooved-end swing check valves, 300 CWP.
 - 4. Iron, center-guided check valves, Class 125, compact wafer.
 - 5. Iron, center-guided check valves, Class 125, metal seat with threaded or flanged end connections.

END OF SECTION 220523.14

SECTION 220529 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Fiberglass pipe hangers.
4. Metal framing systems.
5. Fiberglass strut systems.
6. Thermal-hanger shield inserts.
7. Fastener systems.
8. Pipe stands.
9. Pipe positioning systems.
10. Equipment supports.

- B. Related Sections:

1. Section 055000 "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
2. Section 220516 "Expansion Fittings and Loops for Plumbing Piping" for pipe guides and anchors.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
3. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following; include Product Data for components:
 1. Trapeze pipe hangers.
 2. Metal framing systems.
 3. Fiberglass strut systems.
 4. Pipe stands.
 5. Equipment supports.
- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Detail fabrication and assembly of trapeze hangers.
 2. Design Calculations: Calculate requirements for designing trapeze hangers.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.7 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.

3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

B. Stainless-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.

2.2 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 FIBERGLASS PIPE HANGERS

A. Clevis-Type, Fiberglass Pipe Hangers:

1. Description: Similar to MSS SP-58, Type 1, steel pipe hanger except hanger is made of fiberglass or fiberglass-reinforced resin.
2. Hanger Rods: Continuous-thread rod, washer, and nuts made of stainless steel.

B. Strap-Type, Fiberglass Pipe Hangers:

1. Description: Similar to MSS SP-58, Type 9 or Type 10, steel pipe hanger except hanger is made of fiberglass-reinforced resin.
2. Hanger Rod and Fittings: Continuous-thread rod, washer, and nuts made of stainless steel.

2.4 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. B-line and Eaton business.
 - b. Flex-Strut Inc.
 - c. G-Strut.

- d. Haydon Corporation.
 - e. Thomas & Betts Corporation; A Member of the ABB Group.
 - f. Unistrut; Part of Atkore International.
 - g. Wesanco, Inc.
- 2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
 - 3. Standard: MFMA-4.
 - 4. Channels: Continuous slotted steel channel with inturned lips.
 - 5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
 - 6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
 - 7. Metallic Coating: Hot-dipped galvanized.
 - 8. Paint Coating: Epoxy.
 - 9. Plastic Coating: Epoxy.

B. Non-MFMA Manufacturer Metal Framing Systems:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. CADDY; a brand of nVent.
 - c. Carpenter & Paterson, Inc.
 - d. Empire Industries, Inc.
 - e. FNW; Ferguson Enterprises, Inc.
 - f. Gripple Inc.
 - g. MIRO Industries.
 - h. PHD Manufacturing, Inc.
 - i. Sioux Chief Manufacturing Company, Inc.
- 2. Description: Shop- or field-fabricated pipe-support assembly made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
- 3. Standard: Comply with MFMA-4.
- 4. Channels: Continuous slotted steel channel with inturned lips.
- 5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
- 6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
- 7. Coating: Paint.

2.5 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

- B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.6 PIPE STANDS

- A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
- B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
- C. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.
- D. High-Type, Single-Pipe Stand:
 - 1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
 - 2. Base: Stainless steel.
 - 3. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous-thread rods.
 - 4. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless-steel, roller-type pipe support.
- E. High-Type, Multiple-Pipe Stand:
 - 1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
 - 2. Bases: One or more; plastic.
 - 3. Vertical Members: Two or more protective-coated-steel channels.
 - 4. Horizontal Member: Protective-coated-steel channel.
 - 5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.
- F. Curb-Mounting-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.7 PIPE POSITIONING SYSTEMS

- A. Description: IAPMO PS 42, positioning system of metal brackets, clips, and straps for positioning piping in pipe spaces; for plumbing fixtures in commercial applications.

2.8 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.9 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 - 2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Fiberglass Pipe-Hanger Installation: Comply with applicable portions of MSS SP-69 and MSS SP-89. Install hangers and attachments as required to properly support piping from building structure.
- D. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.
- E. Fiberglass Strut System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled fiberglass struts.
- F. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- G. Fastener System Installation:
 - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- H. Pipe Stand Installation:

1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
 2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. See Section 077200 "Roof Accessories" for curbs.
- I. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture.
- J. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- K. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- L. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- M. Install lateral bracing with pipe hangers and supports to prevent swaying.
- N. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- O. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- P. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- Q. Insulated Piping:
1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.

- a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
- 4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
 - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
 - e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
- 5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
- 6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Section 099123 "Interior Painting."
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports, metal trapeze pipe hangers, and metal framing systems and attachments for general service applications.
- F. Use stainless-steel pipe hangers and fiberglass pipe hangers and stainless-steel or corrosion-resistant attachments for hostile environment applications.
- G. Use copper-plated pipe hangers and copper or stainless-steel attachments for copper piping and tubing.
- H. Use padded hangers for piping that is subject to scratching.
- I. Use thermal-hanger shield inserts for insulated piping and tubing.
- J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
 - 2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.
 - 3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.

4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
 5. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
 6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.
 7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 8. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 10. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
 11. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
 12. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
 13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
 14. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
 15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
 16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.
 17. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
 18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2-1/2 to NPS 24, from single rod if horizontal movement caused by expansion and contraction might occur.
 19. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
 20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
 21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.
- K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- M. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 6. C-Clamps (MSS Type 23): For structural shapes.
 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- N. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

- O. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
 2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
 3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
 4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
 5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
 6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
 7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
 8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
 - a. Horizontal (MSS Type 54): Mounted horizontally.
 - b. Vertical (MSS Type 55): Mounted vertically.
 - c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.
- P. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- Q. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- R. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.
- S. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION 220529

SECTION 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment labels.
 - 2. Warning signs and labels.
 - 3. Pipe labels.
 - 4. Stencils.
 - 5. Valve tags.
 - 6. Warning tags.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve numbering scheme.
- E. Valve Schedules: For each piping system to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Brimar Industries, Inc.

- c. Carlton Industries, LP.
 - d. Champion America.
 - e. Craftmark Pipe Markers.
 - f. emedco.
 - g. Kolbi Pipe Marker Co.
 - h. LEM Products Inc.
 - i. Marking Services, Inc.
 - j. Seton Identification Products.
2. Material and Thickness: Brass, 0.032-inch stainless steel, 0.025-inch aluminum, 0.032-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 3. Letter Color: White.
 4. Background Color: Black.
 5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
 7. Fasteners: Stainless-steel self-tapping screws.
 8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Brimar Industries, Inc.
 - c. Carlton Industries, LP.
 - d. Champion America.
 - e. Craftmark Pipe Markers.
 - f. emedco.
 - g. Kolbi Pipe Marker Co.
 - h. LEM Products Inc.
 - i. Marking Services, Inc.
 - j. Seton Identification Products.
2. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
3. Letter Color: White.
4. Background Color: Black.
5. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
6. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
7. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
8. Fasteners: Stainless-steel rivets or self-tapping screws.

9. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.
- D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number, and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.
 4. Champion America.
 5. Craftmark Pipe Markers.
 6. emedco.
 7. LEM Products Inc.
 8. Marking Services, Inc.
 9. National Marker Company.
 10. Seton Identification Products.
 11. Stranco, Inc.
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- C. Letter Color: White.
- D. Background Color: Black.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- H. Fasteners: Stainless-steel rivets or self-tapping screws.
- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- J. Label Content: Include caution and warning information plus emergency notification instructions.

2.3 PIPE LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Actioncraft Products, Inc.; a division of Industrial Test Equipment Co, Inc.
 2. Brady Corporation.
 3. Brimar Industries, Inc.
 4. Carlton Industries, LP.
 5. Champion America.
 6. Craftmark Pipe Markers.
 7. emedco.
 8. Kolbi Pipe Marker Co.
 9. LEM Products Inc.
 10. Marking Services, Inc.
 11. Seton Identification Products.
- B. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- C. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- D. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- E. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.
1. Flow-Direction Arrows: Integral with piping-system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
 2. Lettering Size: Size letters according to ASME A13.1 for piping at least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances.

2.4 STENCILS

- A. Stencils for Piping:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brimar Industries, Inc.
 - b. Carlton Industries, LP.
 - c. Champion America.
 - d. Craftmark Pipe Markers.
 - e. Kolbi Pipe Marker Co.
 - f. Marking Services, Inc.

2. Lettering Size: Size letters according to ASME A13.1 for piping at least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances.
3. Stencil Material: Fiberboard or metal.
4. Stencil Paint: Exterior, gloss, acrylic enamel in colors complying with recommendations in ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.
5. Identification Paint: Exterior, acrylic enamel in colors according to ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.

2.5 VALVE TAGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Actioncraft Products, Inc.; a division of Industrial Test Equipment Co, Inc.
 2. Brady Corporation.
 3. Brimar Industries, Inc.
 4. Carlton Industries, LP.
 5. Champion America.
 6. Craftmark Pipe Markers.
 7. emedco.
 8. Kolbi Pipe Marker Co.
 9. LEM Products Inc.
 10. Marking Services, Inc.
 11. Seton Identification Products.
- B. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
1. Tag Material: Brass, 0.032-inch stainless steel, 0.025-inch aluminum, 0.032-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 2. Fasteners: Brass wire-link chain or beaded chain or S-hook.
- C. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
1. Valve-tag schedule shall be included in operation and maintenance data.

2.6 WARNING TAGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.

4. Champion America.
5. Craftmark Pipe Markers.
6. emedco.
7. Kolbi Pipe Marker Co.
8. LEM Products Inc.
9. Marking Services, Inc.
10. Seton Identification Products.

- A. Description: Preprinted or partially preprinted accident-prevention tags of plasticized card stock with matte finish suitable for writing.
1. Size: 3 by 5-1/4 inches minimum approximately 4 by 7 inches.
 2. Fasteners: Brass grommet and wire or reinforced grommet and wire or string.
 3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
 4. Color: Safety yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

3.3 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.4 PIPE LABEL INSTALLATION

- A. Piping Color Coding: Painting of piping is specified in Section 099123 "Interior Painting."
- B. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, with painted, color-coded bands or rectangles on each piping system.

1. Identification Paint: Use for contrasting background.
 2. Stencil Paint: Use for pipe marking.
- C. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
1. Near each valve and control device.
 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 5. Near major equipment items and other points of origination and termination.
 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- D. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.
- E. Pipe Label Color Schedule:
1. Domestic Water Piping
 - a. Background: Safety green.
 - b. Letter Colors: White.
 2. Sanitary Waste Piping:
 - a. Background Color: Safety purple.
 - b. Letter Color: White.

3.5 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
1. Valve-Tag Size and Shape:
 - a. Cold Water: 1-1/2 inches, round.
 - b. Hot Water: 1-1/2 inches, round.
 2. Valve-Tag Colors:
 - a. Cold Water: Safety green.

b. Hot Water: Safety green.

3. Letter Colors:

a. Cold Water: White

b. Hot Water: White.

3.6 WARNING-TAG INSTALLATION

A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 220553

SECTION 220719 - PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes insulating the following plumbing piping services:
 - 1. Domestic cold-water piping.
 - 2. Domestic hot-water piping.
 - 3. Domestic recirculating hot-water piping.
 - 4. Roof drains and rainwater leaders.
 - 5. Supplies and drains for handicap-accessible lavatories and sinks.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied, if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
 - 2. Detail insulation application at pipe expansion joints for each type of insulation.
 - 3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
 - 4. Detail removable insulation at piping specialties, equipment connections, and access panels.
 - 5. Detail application of field-applied jackets.
 - 6. Detail application at linkages of control devices.
- C. Samples: For each type of insulation and jacket indicated. Identify each Sample, describing product and intended use. Sample sizes are as follows:
 - 1. Preformed Pipe Insulation Materials: 12 inches long by NPS 2.
 - 2. Jacket Materials for Pipe: 12 inches long by NPS 2.
 - 3. Sheet Jacket Materials: 12 inches square.
 - 4. Manufacturer's Color Charts: For products where color is specified, show the full range of colors available for each type of finish material.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.
- C. Comply with the following applicable standards and other requirements specified for miscellaneous components:
 - 1. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.8 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Pittsburgh Corning Corporation.
 - 2. Block Insulation: ASTM C 552, Type I.
 - 3. Special-Shaped Insulation: ASTM C 552, Type III.
 - 4. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.
 - 5. Preformed Pipe Insulation with Factory-Applied ASJ: Comply with ASTM C 552, Type II, Class 2.
 - 6. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.
- G. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. K-Flex USA.
- H. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. Johns Manville; a Berkshire Hathaway Company.
 - c. Knauf Insulation.
 - d. Manson Insulation Inc.
 - e. Owens Corning.
- I. Mineral-Fiber, Preformed Pipe Insulation:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Johns Manville; a Berkshire Hathaway Company.
 - b. Knauf Insulation.
 - c. Manson Insulation Inc.
 - d. Owens Corning.

Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
- J. Phenolic:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. Resolco, Inc.
 2. Preformed pipe insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type III, Grade 1.
 3. Block insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type II, Grade 1.
 4. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.

5. Factory-Applied Jacket: Requirements are specified in "Factory-Applied Jackets" Article.
- K. Polyolefin: Unicellular, polyethylene thermal plastic insulation. Comply with ASTM C 534 or ASTM C 1427, Type I, Grade 1 for tubular materials.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Armacell LLC.

2.2 INSULATING CEMENTS

- A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Ramco Insulation, Inc.
- B. Expanded or Exfoliated Vermiculite Insulating Cement: Comply with ASTM C 196.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Ramco Insulation, Inc.
- C. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Ramco Insulation, Inc.

2.3 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
- B. Cellular-Glass Adhesive: Two-component, thermosetting urethane adhesive containing no flammable solvents, with a service temperature range of minus 100 to plus 200 deg F.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Foster Brand; H.B. Fuller Construction Products.

2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. K-Flex USA.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Phenolic Adhesive: Solvent-based resin adhesive, with a service temperature range of minus 75 to plus 300 deg F.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

F. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

G. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Dow Consumer Solutions.
 - b. Johns Manville; a Berkshire Hathaway company.
 - c. P.I.C. Plastics, Inc.
 - d. Speedline Corporation.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

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- a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Knauf Insulation.
 - d. Vimasco Corporation.
 2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 5. Color: White.
- C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below-ambient services.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
 2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
 3. Service Temperature Range: 0 to 180 deg F.
 4. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
 5. Color: White.
- D. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Knauf Insulation.
 - d. Mon-Eco Industries, Inc.
 - e. Vimasco Corporation.
 2. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 4. Solids Content: 60 percent by volume and 66 percent by weight.
 5. Color: White.

2.5 LAGGING ADHESIVES

- A. Description: Comply with MIL-A-3316C, Class I, Grade A, and shall be compatible with insulation materials, jackets, and substrates.

1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Vimasco Corporation.
3. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over pipe insulation.
4. Service Temperature Range: 0 to plus 180 deg F.
5. Color: White.

2.6 SEALANTS

A. Joint Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
 - d. Pittsburgh Corning Corporation.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Permanently flexible, elastomeric sealant.
4. Service Temperature Range: Minus 100 to plus 300 deg F.
5. Color: White or gray.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. FSK and Metal Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.

5. Color: Aluminum.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.7 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
 2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
 3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.8 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

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- a. Johns Manville; a Berkshire Hathaway company.
 - b. P.I.C. Plastics, Inc.
 - c. Proto Corporation.
 - d. Speedline Corporation.
2. Adhesive: As recommended by jacket material manufacturer.
 3. Color: Color as selected by Architect.
 4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
 - a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

2.9 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

- B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
2. Width: 3 inches.

3. Thickness: 6.5 mils.
 4. Adhesion: 90 ounces force/inch in width.
 5. Elongation: 2 percent.
 6. Tensile Strength: 40 lbf/inch in width.
 7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.
- C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Ideal Tape Co., Inc., an American Biltrite Company.
 2. Width: 2 inches.
 3. Thickness: 6 mils.
 4. Adhesion: 64 ounces force/inch in width.
 5. Elongation: 500 percent.
 6. Tensile Strength: 18 lbf/inch in width.
- D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
 2. Width: 2 inches.
 3. Thickness: 3.7 mils.
 4. Adhesion: 100 ounces force/inch in width.
 5. Elongation: 5 percent.
 6. Tensile Strength: 34 lbf/inch in width.

2.10 SECUREMENTS

- A. Bands:
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. RPR Products, Inc.

1. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304; 0.015 inch thick, 1/2 inch wide with wing seal or closed seal.
 2. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing seal or closed seal.
- B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.
- C. Wire: 0.062-inch soft-annealed, galvanized steel.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. C & F Wire.

2.11 PROTECTIVE SHIELDING GUARDS

- A. Protective Shielding Pipe Covers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Buckaroos, Inc.
 - b. Just Manufacturing.
 - c. McGuire Manufacturing.
 - d. MVG Molded Products.
 - e. Plumberex Specialty Products, Inc.
 - f. Truebro.
 - g. Zurn Industries, LLC.
 2. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.
- B. Protective Shielding Piping Enclosures:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Truebro.
 - b. Zurn Industries, LLC.
 2. Description: Manufactured plastic enclosure for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with ADA requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 - 1. Verify that systems to be insulated have been tested and are free of defects.
 - 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
 - 1. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
- C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

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- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
 - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
 - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
 - a. For below-ambient services, apply vapor-barrier mastic over staples.
 - 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above-ambient services, do not install insulation to the following:

1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Cleanouts.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.

1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:

1. Pipe: Install insulation continuously through floor penetrations.

2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
 1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
 3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
 5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
 6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
 7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
 8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
 9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation

at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

- D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
 2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
 3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
 4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
 5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF CELLULAR-GLASS INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient services, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of cellular-glass block insulation of same thickness as pipe insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When preformed sections of insulation are not available, install mitered sections of cellular-glass insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of cellular-glass insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.

3.7 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.8 INSTALLATION OF MINERAL-FIBER INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.9 INSTALLATION OF PHENOLIC INSULATION

A. General Installation Requirements:

1. Secure single-layer insulation with stainless-steel bands at 12-inch intervals and tighten bands without deforming insulation materials.

2. Install 2-layer insulation with joints tightly butted and staggered at least 3 inches. Secure inner layer with 0.062-inch wire spaced at 12-inch intervals. Secure outer layer with stainless-steel bands at 12-inch intervals.

B. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient services, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets with vapor retarders on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

C. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of block insulation of same material and thickness as pipe insulation.

D. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed insulation sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.

E. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed insulation sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.

3.10 INSTALLATION OF POLYOLEFIN INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Seal split-tube longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of polyolefin sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of polyolefin pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install cut sections of polyolefin pipe and sheet insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.11 FIELD-APPLIED JACKET INSTALLATION

A. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

- D. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.13 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - 1. Drainage piping located in crawl spaces.
 - 2. Underground piping.
 - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.14 INDOOR PIPING INSULATION SCHEDULE

- A. Domestic Cold Water:
 - 1. NPS 1 and Smaller: Insulation shall be one of the following:
 - a. Cellular Glass: 1-1/2 inches thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - d. Phenolic: 1 inch thick.
 - e. Polyolefin: 1 inch thick.
 - 2. NPS 1-1/4 and Larger: Insulation shall be one of the following:
 - a. Cellular Glass: 1-1/2 inches thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - d. Phenolic: 1 inch thick.
 - e. Polyolefin: 1 inch thick.
- B. Domestic Hot and Recirculated Hot Water:
 - 1. NPS 1-1/4 and Smaller: Insulation shall be one of the following:
 - a. Cellular Glass: 1-1/2 inches thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - d. Phenolic: 1 inch thick.
 - e. Polyolefin: 1 inch thick.
 - 2. NPS 1-1/2 and Larger: Insulation shall be one of the following:

- a. Cellular Glass: 1-1/2 inches thick.
- b. Flexible Elastomeric: 1 inch thick.
- c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
- d. Phenolic: 1 inch thick.
- e. Polyolefin: 1 inch thick.

C. Stormwater:

- 1. All Pipe Sizes: Insulation shall be one of the following:
 - a. Cellular Glass: 1-1/2 inch thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - d. Phenolic: 1 inch thick.
 - e. Polyolefin: 1 inch thick.

D. Roof Drain Bodies:

- 1. All Pipe Sizes: Insulation shall be one of the following:
 - a. Cellular Glass: 1-1/2 inch thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
 - d. Phenolic: 1 inch thick.
 - e. Polyolefin: 1 inch thick.

E. Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities:

- 1. All Pipe Sizes: Insulation shall be one of the following:
 - a. Flexible Elastomeric: 1/2 inch thick.
 - b. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.
 - c. Polyolefin: 1/2 inch thick.

3.15 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Concealed:
 - 1. None.
- D. Piping, Exposed:
 - 1. PVC, Color-Coded by System: 20 mils thick.

END OF SECTION 220719

PLUMBING PIPING INSULATION

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SECTION 221116 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Under-building-slab and aboveground domestic water pipes, tubes, and fittings inside buildings.
- 2. Encasement for piping.

- B. Related Requirements:

- 1. Section 221113 "Facility Water Distribution Piping" for water-service piping outside the building from source to the point where water-service piping enters the building.

1.3 ACTION SUBMITTALS

- A. Product Data: For transition fittings and dielectric fittings.

1.4 INFORMATIONAL SUBMITTALS

- A. System purging and disinfecting activities report.
- B. Field quality-control reports.

1.5 FIELD CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 - 1. Notify Architect, Construction Manager, or Owner no fewer than five days in advance of proposed interruption of water service.
 - 2. Do not interrupt water service without Architect's, Construction Manager's, or Owner's written permission.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.
- B. Potable-water piping and components shall comply with NSF 14 and NSF 61 Annex G. Plastic piping components shall be marked with "NSF-pw."

2.2 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type L and ASTM B 88, Type M water tube, drawn temper.
- B. Soft Copper Tube: ASTM B 88, Type K and ASTM B 88, Type L water tube, annealed temper.
- C. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.
- D. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
- E. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
- F. Copper Unions:
 - 1. MSS SP-123.
 - 2. Cast-copper-alloy, hexagonal-stock body.
 - 3. Ball-and-socket, metal-to-metal seating surfaces.
 - 4. Solder-joint or threaded ends.
- G. Copper Pressure-Seal-Joint Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. Elkhart Products Corporation.
 - c. Mueller Industries, Inc.
 - d. NIBCO INC.
 - e. Viega LLC.
 - 2. Fittings for NPS 2 and Smaller: Wrought-copper fitting with EPDM-rubber, O-ring seal in each end.
 - 3. Fittings for NPS 2-1/2 to NPS 4: Cast-bronze or wrought-copper fitting with EPDM-rubber, O-ring seal in each end.
- H. Copper Push-on-Joint Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Apollo Flow Controls; Conbraco Industries, Inc.
- b. Elkhart Products Corporation.
- c. NIBCO INC.
- d. Victaulic Company.

2. Description:

- a. Cast-copper fitting complying with ASME B16.18 or wrought-copper fitting complying with ASME B 16.22.
- b. Stainless-steel teeth and EPDM-rubber, O-ring seal in each end instead of solder-joint ends.

I. Copper-Tube, Extruded-Tee Connections:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. T-DRILL Industries Inc.

2. Description: Tee formed in copper tube according to ASTM F 2014.

2.3 CPVC PIPING

A. CPVC Pipe: ASTM F 441/F 441M, Schedule 40.

1. CPVC Socket Fittings: ASTM F 438 for Schedule 40.
2. CPVC Threaded Fittings: ASTM F 437, Schedule 80.

B. CPVC Piping System: ASTM D 2846/D 2846M, SDR 11, pipe and socket fittings.

C. CPVC Tubing System: ASTM D 2846/D 2846M, SDR 11, tube and socket fittings.

2.4 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials:

1. AWWA C110/A21.10, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free unless otherwise indicated.
2. Full-face or ring type unless otherwise indicated.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys.

D. Flux: ASTM B 813, water flushable.

E. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

- F. Solvent Cements for Joining CPVC Piping and Tubing: ASTM F 493.
 - 1. CPVC solvent cement shall have a VOC content of 490 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Solvent cement and adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- G. Plastic, Pipe-Flange Gaskets, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.5 ENCASEMENT FOR PIPING

- A. Standard: ASTM A 674 or AWWA C105/A21.5.
- B. Form: Sheet or tube.
- C. Color: Black or natural.

2.6 TRANSITION FITTINGS

- A. General Requirements:
 - 1. Same size as pipes to be joined.
 - 2. Pressure rating at least equal to pipes to be joined.
 - 3. End connections compatible with pipes to be joined.
- B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
- C. Sleeve-Type Transition Coupling: AWWA C219.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cascade Waterworks Mfg. Co.
 - b. Dresser, Inc.
 - c. Ford Meter Box Company, Inc. (The).
 - d. Jay R. Smith Mfg. Co.
 - e. JCM Industries, Inc.
 - f. Romac Industries, Inc.
 - g. Smith-Blair, Inc.
 - h. Viking Johnson.
- D. Plastic-to-Metal Transition Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Charlotte Pipe and Foundry Company.
 - b. Harvel Plastics, Inc.
 - c. Sioux Chief Manufacturing Company, Inc.
 - d. Spears Manufacturing Company.
 - e. Uponor.
 2. Description:
 - a. CPVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions.
 - b. One end with threaded brass insert and one solvent-cement-socket end.
- E. Plastic-to-Metal Transition Unions:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Colonial Engineering, Inc.
 - b. NIBCO, INC.
 - c. Spears Manufacturing Company.
 2. Description:
 - a. CPVC four-part union.
 - b. Brass or stainless-steel threaded end.
 - c. Solvent-cement-joint plastic end.
 - d. Rubber O-ring.
 - e. Union nut.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Comply with requirements in Section 312000 "Earth Moving" for excavating, trenching, and backfilling.

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."
- C. Install underground copper tube in PE encasement according to ASTM A 674 or AWWA C105/A21.5.

- D. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve inside the building at each domestic water-service entrance. Comply with requirements for pressure gages in Section 220519 "Meters and Gages for Plumbing Piping" and with requirements for drain valves and strainers in Section 221119 "Domestic Water Piping Specialties."
- E. Install domestic water piping level without pitch and plumb.
- F. Rough-in domestic water piping for water-meter installation according to utility company's requirements.
- G. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- H. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- I. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- J. Install piping to permit valve servicing.
- K. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.
- L. Install piping free of sags and bends.
- M. Install fittings for changes in direction and branch connections.
- N. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
- O. Install pressure gages on suction and discharge piping for each plumbing pump and packaged booster pump. Comply with requirements for pressure gages in Section 220519 "Meters and Gages for Plumbing Piping."
- P. Install thermostats in hot-water circulation piping. Comply with requirements for thermostats in Section 221123 "Domestic Water Pumps."
- Q. Install thermometers on outlet piping from each water heater. Comply with requirements for thermometers in Section 220519 "Meters and Gages for Plumbing Piping."
- R. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- S. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- T. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.3 JOINT CONSTRUCTION

- A. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- B. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- C. Brazed Joints for Copper Tubing: Comply with CDA's "Copper Tube Handbook," "Braze Joints" chapter.
- D. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- E. Pressure-Sealed Joints for Copper Tubing: Join copper tube and pressure-seal fittings with tools recommended by fitting manufacturer.
- F. Push-on Joints for Copper Tubing: Clean end of tube. Measure insertion depth with manufacturer's depth gage. Join copper tube and push-on-joint fittings by inserting tube to measured depth.
- G. Extruded-Tee Connections: Form tee in copper tube according to ASTM F 2149. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.
- H. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.
- I. Joint Construction for Solvent-Cemented Plastic Piping: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements. Apply primer.
 - 2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.

3.4 TRANSITION FITTING INSTALLATION

- A. Install transition couplings at joints of dissimilar piping.
- B. Transition Fittings in Underground Domestic Water Piping:
 - 1. Fittings for NPS 1-1/2 and Smaller: Fitting-type coupling.
 - 2. Fittings for NPS 2 and Larger: Sleeve-type coupling.

- C. Transition Fittings in Aboveground Domestic Water Piping NPS 2 and Smaller: Plastic-to-metal transition unions.

3.5 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for seismic-restraint devices in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- B. Comply with requirements for pipe hanger, support products, and installation in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
 - 1. Vertical Piping: MSS Type 8 or 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
 - 2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 - 4. NPS 2-1/2: 108 inches with 1/2-inch rod.
 - 5. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
- F. Install supports for vertical copper tubing every 10 feet.
- G. Install vinyl-coated hangers for CPVC piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1 and Smaller: 36 inches with 3/8-inch rod.
 - 2. NPS 1-1/4 to NPS 2: 48 inches with 3/8-inch rod.
 - 3. NPS 2-1/2 to NPS 3-1/2: 48 inches with 1/2-inch rod.
 - 4. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
- H. Install supports for vertical CPVC piping every 60 inches for NPS 1 and smaller, and every 72 inches for NPS 1-1/4 and larger.
- I. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.
- C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
 - 1. Domestic Water Booster Pumps: Cold-water suction and discharge piping.
 - 2. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
 - 3. Plumbing Fixtures: Cold- and hot-water-supply piping in sizes indicated, but not smaller than that required by plumbing code.
 - 4. Equipment: Cold- and hot-water-supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.7 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification materials and installation in Section 220553 "Identification for Plumbing Piping and Equipment."
- B. Label pressure piping with system operating pressure.

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Piping Inspections:
 - a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
 - b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
 - 1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
 - 2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
 - c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.

- d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
2. Piping Tests:
- a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
 - b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
 - c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 - d. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 - e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
 - f. Prepare reports for tests and for corrective action required.
- B. Domestic water piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.
- 3.9 ADJUSTING
- A. Perform the following adjustments before operation:
- 1. Close drain valves, hydrants, and hose bibbs.
 - 2. Open shutoff valves to fully open position.
 - 3. Open throttling valves to proper setting.
 - 4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
 - a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
 - b. Adjust calibrated balancing valves to flows indicated.
 - 5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
 - 6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
 - 7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
 - 8. Check plumbing specialties and verify proper settings, adjustments, and operation.
- 3.10 CLEANING
- A. Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
 - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
 - d. Repeat procedures if biological examination shows contamination.
 - e. Submit water samples in sterile bottles to authorities having jurisdiction.

B. Clean non-potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging procedures prescribed by authorities having jurisdiction or; if methods are not prescribed, follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

C. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.

D. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.11 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.
- D. Under-building-slab, domestic water, building-service piping, NPS 3 and smaller, shall be the following:

1. Soft copper tube, ASTM B 88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
- E. Under-building-slab, domestic water piping, NPS 2 and smaller, shall be the following:
1. Hard copper tube, ASTM B 88, Type L; wrought-copper, solder-joint fittings; and brazed sealed joints.
- F. Aboveground domestic water piping, NPS 2 and smaller, shall be one of the following:
1. Hard copper tube, ASTM B 88, Type L; cast- or wrought- copper, solder-joint fittings; and soldered joints.
 2. Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.
 3. Hard copper tube, ASTM B 88, Type L; copper push-on-joint fittings; and push-on joints.
 4. CPVC, Schedule 40; socket fittings; and solvent-cemented joints.
 5. CPVC, Schedule 80 pipe; CPVC, Schedule 80 threaded fittings; and threaded joints.
 6. CPVC Tubing System: CPVC tube; CPVC socket fittings; and solvent-cemented joints. NPS 1-1/2 and NPS 2 CPVC pipe with CPVC socket fittings may be used instead of tubing.
- G. Aboveground domestic water piping, NPS 2-1/2 to NPS 4, shall be one of the following:
1. Hard copper tube, ASTM B 88, Type L; cast- or wrought- copper, solder-joint fittings; and soldered joints.
 2. Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.
 3. CPVC, Schedule 40; socket fittings; and solvent-cemented joints.
 4. CPVC, Schedule 80 pipe; CPVC, Schedule 80 threaded fittings; and threaded joints.

3.12 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
1. Shutoff Duty: Use ball or gate valves for piping NPS 2 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 and larger.
 2. Throttling Duty: Use ball or globe valves for piping NPS 2 and smaller. Use butterfly or ball valves with flanged ends for piping NPS 2-1/2 and larger.
 3. Hot-Water Circulation Piping, Balancing Duty: Calibrated balancing valves.
 4. Drain Duty: Hose-end drain valves.
- B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

END OF SECTION 221116

SECTION 221119 - DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
- B. Related Requirements:
 - 1. Section 220519 "Meters and Gages for Plumbing Piping" for thermometers, pressure gages, and flow meters in domestic water piping.
 - 2. Section 221116 "Domestic Water Piping" for water meters.
 - 3. Section 224716 "Pressure Water Coolers" for water filters for water coolers.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For domestic water piping specialties.
 - 1. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

- A. Potable-water piping and components shall comply with NSF 61 Annex G and NSF 14. Mark "NSF-pw" on plastic piping components.

2.2 PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.3 DOMESTIC WATER PIPING SPECIALTIES

- A. Refer to Plumbing Fixture Schedule on Drawings for specialty item, make, model number and description.

2.4 SPECIALTY VALVES

- A. Comply with requirements for general-duty metal valves in Section 220523.12 "Ball Valves for Plumbing Piping," and Section 220523.14 "Check Valves for Plumbing Piping."

- B. CPVC Union Ball Valves:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. American Valve, Inc.
 - b. Asahi/America.
 - c. Colonial Engineering, Inc.
 - d. Georg Fischer Inc.
 - e. Hayward Flow Control.
 - f. IPEX USA LLC.
 - g. NIBCO INC.
 - h. Spears Manufacturing Company.
 - i. Thermoplastic Valves, Inc.

- 2. Description:

- a. Standard: MSS SP-122.
 - b. Pressure Rating and Temperature: 125 psig at 73 deg F.
 - c. Body Material: CPVC.
 - d. Body Design: Union type.
 - e. End Connections for Valves NPS 2 and Smaller: Detachable, socket.
 - f. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, socket or threaded.
 - g. Ball: CPVC; full port.
 - h. Seals: PTFE or EPDM-rubber O-rings.
 - i. Handle: Tee shaped.

- C. CPVC Non-Union Ball Valves:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. American Valve, Inc.
 - b. Asahi/America.

- c. KBI (King Bros. Industries).
- d. Legend Valve & Fitting, Inc.
- e. NIBCO INC.
- f. Spears Manufacturing Company.
- g. Thermoplastic Valves, Inc.

2. Description:

- a. Standard: MSS SP-122.
- b. Pressure Rating and Temperature: 125 psig at 73 deg F.
- c. Body Material: CPVC.
- d. Body Design: Non-union type.
- e. End Connections: Socket or threaded.
- f. Ball: CPVC; full or reduced port.
- g. Seals: PTFE or EPDM-rubber O-rings.
- h. Handle: Tee shaped.

D. CPVC Ball Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. American Valve, Inc.
- b. Asahi/America.
- c. Colonial Engineering, Inc.
- d. Georg Fischer Inc.
- e. Hayward Flow Control.
- f. IPEX USA LLC.
- g. NIBCO INC.
- h. Spears Manufacturing Company.
- i. Thermoplastic Valves, Inc.

2. Description:

- a. Pressure Rating and Temperature: 125 psig at 73 deg F.
- b. Body Material: CPVC.
- c. Body Design: Union-type ball check.
- d. End Connections for Valves NPS 2 and Smaller: Detachable, socket.
- e. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, socket or threaded.
- f. Ball: CPVC.
- g. Seals: EPDM- or FKM-rubber O-rings.

2.5 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1. Flex-Hose Co., Inc.
- 2. Mason Industries, Inc.
- 3. Metraflex Company (The).

- B. Bronze-Hose Flexible Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.
 - 1. Working-Pressure Rating: Minimum 200 psig.
 - 2. End Connections NPS 2 and Smaller: Threaded copper pipe or plain-end copper tube.
 - 3. End Connections NPS 2-1/2 and Larger: Flanged copper alloy.
- C. Stainless-Steel-Hose Flexible Connectors: Corrugated-stainless-steel tubing with stainless-steel wire-braid covering and ends welded to inner tubing.
 - 1. Working-Pressure Rating: Minimum 200 psig.
 - 2. End Connections NPS 2 and Smaller: Threaded steel-pipe nipple.
 - 3. End Connections NPS 2-1/2 and Larger: Flanged steel nipple.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.
 - 1. Locate backflow preventers in same room as connected equipment or system.
 - 2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe-to-floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are unacceptable for this application.
 - 3. Do not install bypass piping around backflow preventers.
- B. Install water regulators with inlet and outlet shutoff valves and bypass with memory-stop balancing valve. Install pressure gages on inlet and outlet.
- C. Install water-control valves with inlet and outlet shutoff valve and bypass with globe valve. Install pressure gages on inlet and outlet.
- D. Install balancing valves in locations where they can easily be adjusted.
- E. Install temperature-actuated, water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
 - 1. Install cabinet-type units recessed in or surface mounted on wall as specified.
- F. Install Y-pattern strainers for water on supply side of each control valve, water pressure-reducing valve, solenoid valve and pump.
- G. Install outlet boxes recessed in wall or surface mounted on wall. Install 2-by-4-inch fire-retardant-treated-wood blocking, wall reinforcement between studs. Comply with requirements for fire-retardant-treated-wood blocking in Section 061000 "Rough Carpentry."
- H. Install hose stations with check stops or shutoff valves on inlets and with thermometer on outlet.

1. Install cabinet-type units recessed in or surface mounted on wall as specified. Install 2-by-4-inch fire-retardant-treated-wood blocking, wall reinforcement between studs. Comply with requirements for fire-retardant-treated-wood blocking in Section 061000 "Rough Carpentry."
 - I. Install water-hammer arresters in water piping according to PDI-WH 201.
 - J. Install air vents at high points of water piping. Install drain piping and discharge onto floor drain.
 - K. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
 - L. Install drainage-type, trap-seal primer valves as lavatory trap with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting.
 - M. Install trap-seal primer systems with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust system for proper flow.
- 3.2 CONNECTIONS
- A. Comply with requirements for ground equipment in Section 260526 "Grounding and Bonding for Electrical Systems."
 - B. Fire-retardant-treated-wood blocking is specified in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for electrical connections.
- 3.3 LABELING AND IDENTIFYING
- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
 1. Pressure vacuum breakers.
 2. Intermediate atmospheric-vent backflow preventers.
 3. Reduced-pressure-principle backflow preventers.
 4. Double-check, backflow-prevention assemblies.
 5. Carbonated-beverage-machine backflow preventers.
 6. Dual-check-valve backflow preventers.
 7. Reduced-pressure-detector, fire-protection, backflow-preventer assemblies.
 8. Double-check, detector-assembly backflow preventers.
 9. Water pressure-reducing valves.
 10. Calibrated balancing valves.
 11. Primary, thermostatic, water mixing valves.
 12. Manifold, thermostatic, water mixing-valve assemblies.
 13. Photographic-process, thermostatic, water mixing-valve assemblies.
 14. Primary water tempering valves.
 15. Outlet boxes.
 16. Hose stations.
 17. Supply-type, trap-seal primer valves.

18. Trap-seal primer systems.

- B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Test each pressure vacuum breaker, reduced-pressure-principle backflow preventer, double-check, backflow-prevention assembly and double-check, detector-assembly backflow preventer according to authorities having jurisdiction and the device's reference standard.
- B. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Set field-adjustable pressure set points of water pressure-reducing valves.
- B. Set field-adjustable flow set points of balancing valves.
- C. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.

END OF SECTION 221119

SECTION 221123 - DOMESTIC WATER PUMPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. In-line, sealless centrifugal pumps.

1.2 ACTION SUBMITTALS

- ##### A. Product Data:
- For each type of product indicated. Include materials of construction, rated capacities, certified performance curves with operating points plotted on curves, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.3 CLOSEOUT SUBMITTALS

- ##### A. Operation and Maintenance Data:
- For domestic water pumps to include in operation and maintenance manuals.

1.4 QUALITY ASSURANCE

- ##### A. Electrical Components, Devices, and Accessories:
- Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- ##### B. UL Compliance:
- Comply with UL 778 for motor-operated water pumps.

PART 2 - PRODUCTS

2.1 IN-LINE, SEALLESS CENTRIFUGAL PUMPS

- ##### A. Description:
- Factory-assembled and -tested, in-line, close-coupled, canned-motor, sealless, overhung-impeller centrifugal pumps.
- ##### B. Pump Construction:
1. Pump and Motor Assembly: Hermetically sealed, replaceable-cartridge type with motor and impeller on common shaft and designed for installation with pump and motor shaft horizontal.
 2. Casing: Bronze, with threaded or companion-flange connections.
 3. Impeller: Plastic.
 4. Motor: Single speed, unless otherwise indicated.

C. Capacities and Characteristics:

1. See Schedule on Plumbing Drawings.

2.2 MOTORS

A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 220513 "Common Motor Requirements for Plumbing Equipment."

1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

2.3 CONTROLS

A. Thermostats: Electric; adjustable for control of hot-water circulation.

1. Type: Water-immersion temperature sensor, for installation in piping.
2. Range: 50 to 125 deg F for hot water return serving the REC.
3. Operation of Pump: On or off.
4. Power Requirement: 120 V, ac.
5. Settings: Start pump at 105 deg F for hot water return serving the REC, and stop pump at 110 deg F for hot water return serving the REC.

PART 3 - EXECUTION

3.1 PUMP INSTALLATION

- A. Comply with HI 1.4.
- B. Install in-line, sealless centrifugal pumps with shaft horizontal unless otherwise indicated.
- C. Install continuous-thread hanger rods and spring hangers of size required to support pump weight.
 1. Comply with requirements for hangers and supports specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- D. Install thermostats in hot-water return piping.

3.2 CONNECTIONS

- A. Comply with requirements for piping specified in Section 221116 "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to pumps to allow service and maintenance.

- C. Connect domestic water piping to pumps. Install suction and discharge piping equal to or greater than size of pump nozzles.
- D. Install shutoff valve and strainer on suction side of each pump, and check, shutoff, and throttling valves on discharge side of each pump. Install valves same size as connected piping. Comply with requirements for valves specified in Section 220523.12 "Ball Valves for Plumbing Piping," Section 220523.14 "Check Valves for Plumbing Piping," and comply with requirements for strainers specified in Section 221119 "Domestic Water Piping Specialties."
 - 1. Install pressure gage at suction of each pump and pressure gage at discharge of each pump. Install at integral pressure-gage tapings where provided or install pressure-gage connectors in suction and discharge piping around pumps. Comply with requirements for pressure gages specified in Section 220519 "Meters and Gages for Plumbing Piping."
- E. Connect thermostats to pumps that they control.

3.3 IDENTIFICATION

- A. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment" for identification of pumps.

3.4 ADJUSTING

- A. Adjust domestic water pumps to function smoothly, and lubricate as recommended by manufacturer.
- B. Adjust initial temperature set points.
- C. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

END OF SECTION 221123

SECTION 221316 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe, tube, and fittings.
 - 2. Specialty pipe fittings.
 - 3. Encasement for underground metal piping.

1.3 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water.
 - 2. Waste, Force-Main Piping: 50 psig.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For sovent drainage system. Include plans, elevations, sections, and details.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF/ANSI 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping and "NSF-sewer" for plastic sewer piping.

1.7 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Waste Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
 - 1. Notify Architect, Construction Manager, or Owner no fewer than five days in advance of proposed interruption of sanitary waste service.
 - 2. Do not proceed with interruption of sanitary waste service without Architect's, Construction Manager's, or Owner's written permission.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Service class(es).
- B. Gaskets: ASTM C 564, rubber.
- C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.3 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. Sovent Stack Fittings: ASME B16.45 or ASSE 1043, hubless, cast-iron aerator and deaerator drainage fittings.
- C. CISPI, Hubless-Piping Couplings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Dallas Specialty & Mfg. Co.
 - d. Fernco Inc.
 - e. Ideal Clamp Products, Inc.
 - f. Josam Company.
 - g. Matco-Norca.
 - h. MIFAB, Inc.
 - i. Mission Rubber Company, LLC; a division of MCP Industries.
 - j. NewAge Casting.
 - k. Tyler Pipe; a subsidiary of MCWane Inc.

2. Standards: ASTM C 1277 and CISPI 310.
3. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

D. Heavy-Duty, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Clamp-All Corp.
 - d. Dallas Specialty & Mfg. Co.
 - e. Ideal Clamp Products, Inc.
 - f. MIFAB, Inc.
 - g. Mission Rubber Company, LLC; a division of MCP Industries.
 - h. NewAge Casting.
 - i. Tyler Pipe; a subsidiary of MCWane Inc.
2. Standards: ASTM C 1277 and ASTM C 1540.
3. Description: Stainless-steel shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

E. Cast-Iron, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Charlotte Pipe and Foundry Company.
 - b. MG Piping Products Company.
2. Standard: ASTM C 1277.
3. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.4 GALVANIZED-STEEL PIPE AND FITTINGS

- A. Galvanized-Steel Pipe: ASTM A 53/A 53M, Type E, Standard Weight class. Include square-cut-grooved or threaded ends matching joining method.
- B. Cast-Iron Drainage Fittings: ASME B16.12, threaded.
- C. Steel Pipe Pressure Fittings:
 1. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106/A 106M, Schedule 40, seamless steel pipe. Include ends matching joining method.
 2. Malleable-Iron Unions: ASME B16.39; Class 150; hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface; and female threaded ends.
 3. Gray-Iron, Threaded Fittings: ASME B16.4, Class 125, standard pattern.

D. Cast-Iron Flanges: ASME B16.1, Class 125.

1. Flange Gasket Materials: ASME B16.21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

E. Grooved-Joint, Galvanized-Steel-Pipe Appurtenances:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. Grinnell G-Fire by Johnson Controls Company.
 - c. Shurjoint-Apollo Piping Products USA Inc.
 - d. Smith-Cooper International.
 - e. Victaulic Company.
2. Galvanized, Grooved-End Fittings for Galvanized-Steel Piping: ASTM A 536 ductile-iron castings, ASTM A 47/A 47M malleable-iron castings, ASTM A 234/A 234M forged steel fittings, or ASTM A 106/A 106M steel pipes with dimensions matching ASTM A 53/A 53M steel pipe, and complying with AWWA C606 for grooved ends.
3. Grooved Mechanical Couplings for Galvanized-Steel Piping: ASTM F 1476, Type I. Include ferrous housing sections with continuous curved keys; EPDM-rubber gasket suitable for hot and cold water; and bolts and nuts.

2.5 STAINLESS-STEEL PIPE AND FITTINGS

- A. Pipe and Fittings: ASME A112.3.1, drainage pattern with socket and spigot ends.
- B. Internal Sealing Rings: Elastomeric gaskets shaped to fit socket groove.

2.6 DUCTILE-IRON PIPE AND FITTINGS

A. Ductile-Iron, Mechanical-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Ductile-Iron Fittings: AWWA C110/A21.10, mechanical-joint, ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
3. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

B. Ductile-Iron, Push-on-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51, with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Ductile-Iron Fittings: AWWA C110/A21.10, push-on-joint ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
3. Gaskets: AWWA C111/A21.11, rubber.

C. Ductile-Iron, Grooved-Joint Piping:

1. Ductile-Iron Pipe: AWWA C151/A21.51 with round-cut-grooved ends according to AWWA C606.
2. Ductile-Iron-Pipe Appurtenances:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Anvil International.
 - 2) Shurjoint-Apollo Piping Products USA Inc.
 - 3) Smith-Cooper International.
 - 4) Star Pipe Products.
 - 5) Victaulic Company.
 - b. Grooved-End, Ductile-Iron Fittings: ASTM A 536 ductile-iron castings with dimensions matching AWWA C110/A 21.10 ductile-iron pipe or AWWA C153/A 21.53 ductile-iron fittings and complying with AWWA C606 for grooved ends.
 - c. Grooved Mechanical Couplings for Ductile-Iron Pipe: ASTM F 1476, Type I. Include ferrous housing sections with continuous curved keys; EPDM-rubber center-leg gasket suitable for hot and cold water; and bolts and nuts.

2.7 COPPER TUBE AND FITTINGS

- A. Copper DWV Tube: ASTM B 306, drainage tube, drawn temper.
- B. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.
- C. Hard Copper Tube: ASTM B 88, Type L and Type M, water tube, drawn temper.
- D. Soft Copper Tube: ASTM B 88, Type L, water tube, annealed temper.
- E. Copper Pressure Fittings:
 1. Copper Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
 2. Copper Unions: MSS SP-123, copper-alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.
- F. Copper Flanges: ASME B16.24, Class 150, cast copper with solder-joint end.
 1. Flange Gasket Materials: ASME B16.21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- G. Solder: ASTM B 32, lead free with ASTM B 813, water-flushable flux.

2.8 ABS PIPE AND FITTINGS

- A. Solid-Wall ABS Pipe: ASTM D 2661, Schedule 40.
- B. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.
- C. Solvent Cement: ASTM D 2235.
 - 1. ABS solvent cement shall have a VOC content of 325 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.9 PVC PIPE AND FITTINGS

- A. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
- B. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.
- C. Adhesive Primer: ASTM F 656.
 - 1. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Solvent Cement: ASTM D 2564.
 - 1. PVC solvent cement shall have a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.10 SPECIALTY PIPE FITTINGS

- A. Transition Couplings:
 - 1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.
 - 2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
 - 3. Unshielded, Nonpressure Transition Couplings:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) Dallas Specialty & Mfg. Co.
 - 2) Fernco Inc.
 - 3) Froet Industries LLC.
 - 4) Mission Rubber Company, LLC; a division of MCP Industries.
 - 5) Plastic Oddities.
- b. Standard: ASTM C 1173.
- c. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
- d. Sleeve Materials:
- 1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
 - 2) For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 - 3) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
4. Shielded, Nonpressure Transition Couplings:
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 1) Cascade Waterworks Mfg. Co.
 - 2) Mission Rubber Company, LLC; a division of MCP Industries.
- b. Standard: ASTM C 1460.
- c. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
5. Pressure Transition Couplings:
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 1) Apollo Flow Controls; Conbraco Industries, Inc.
 - 2) Cascade Waterworks Mfg. Co.
 - 3) Dresser, Inc.
 - 4) EBAA Iron, Inc.
 - 5) Ford Meter Box Company, Inc. (The).
 - 6) Jay R. Smith Mfg Co; a division of Morris Group International.
 - 7) JCM Industries, Inc.
 - 8) Romac Industries, Inc.
 - 9) Viking Johnson.
- b. Standard: AWWA C219.
- c. Description: Metal, sleeve-type same size as, with pressure rating at least equal to, and ends compatible with, pipes to be joined.
- d. Center-Sleeve Material: Manufacturer's standard.
- e. Gasket Material: Natural or synthetic rubber.
- f. Metal Component Finish: Corrosion-resistant coating or material.

B. Dielectric Fittings:

1. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
2. Dielectric Unions:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) A.Y. McDonald Mfg. Co.
 - 2) Capitol Manufacturing Company.
 - 3) Central Plastics Company.
 - 4) HART Industrial Unions, LLC.
 - 5) Jomar Valve.
 - 6) Matco-Norca.
 - 7) WATTS.
 - 8) Wilkins.
 - 9) Zurn Industries, LLC.
 - b. Description:
 - 1) Standard: ASSE 1079.
 - 2) Pressure Rating: 125 psig minimum at 180 deg F.
 - 3) End Connections: Solder-joint copper alloy and threaded ferrous.
3. Dielectric Flanges:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Capitol Manufacturing Company.
 - 2) Central Plastics Company.
 - 3) Matco-Norca.
 - 4) WATTS.
 - 5) Wilkins.
 - 6) Zurn Industries, LLC.
 - b. Description:
 - 1) Standard: ASSE 1079.
 - 2) Factory-fabricated, bolted, companion-flange assembly.
 - 3) Pressure Rating: 125 psig minimum at 180 deg F.
 - 4) End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
4. Dielectric-Flange Insulating Kits:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Advance Products & Systems, Inc.
 - 2) Calpico, Inc.
 - 3) Central Plastics Company.

4) Pipeline Seal and Insulator, Inc.

b. Description:

- 1) Nonconducting materials for field assembly of companion flanges.
- 2) Pressure Rating: 150 psig.
- 3) Gasket: Neoprene or phenolic.
- 4) Bolt Sleeves: Phenolic or polyethylene.
- 5) Washers: Phenolic with steel backing washers.

5. Dielectric Nipples:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) Elster Perfection Corporation.
- 2) Grinnell G-Fire by Johnson Controls Company.
- 3) Josam Company.
- 4) Matco-Norca.
- 5) Precision Plumbing Products.
- 6) Victaulic Company.

b. Description:

- 1) Standard: IAPMO PS 66
- 2) Electroplated steel nipple.
- 3) Pressure Rating: 300 psig at 225 deg F.
- 4) End Connections: Male threaded or grooved.
- 5) Lining: Inert and noncorrosive, propylene.

2.11 ENCASEMENT FOR UNDERGROUND METAL PIPING

- A. Standard: ASTM A 674 or AWWA C105/A 21.5.
- B. Material: Linear low-density polyethylene film of 0.008-inch or high-density, cross-laminated polyethylene film of 0.004-inch minimum thickness.
- C. Form: Sheet or tube.
- D. Color: Black or natural.

PART 3 - EXECUTION

3.1 EARTH MOVING

- A. Comply with requirements for excavating, trenching, and backfilling specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- K. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- L. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:
 - 1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
 - 2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
 - 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- M. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

1. Install encasement on underground piping according to ASTM A 674 or AWWA C105/A 21.5.
- N. Install steel piping according to applicable plumbing code.
- O. Install stainless-steel piping according to ASME A112.3.1 and applicable plumbing code.
- P. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."
- Q. Install aboveground ABS piping according to ASTM D 2661.
- R. Install aboveground PVC piping according to ASTM D 2665.
- S. Install underground ABS and PVC piping according to ASTM D 2321.
- T. Install engineered soil and waste drainage and vent piping systems as follows:
1. Combination Waste and Vent: Comply with standards of authorities having jurisdiction.
 2. Solvent Drainage System: Comply with ASSE 1043 and solvent fitting manufacturer's written installation instructions.
 3. Reduced-Size Venting: Comply with standards of authorities having jurisdiction.
- U. Install underground, ductile-iron, force-main piping according to AWWA C600. Install buried piping inside building between wall and floor penetrations and connection to sanitary sewer piping outside building with restrained joints. Anchor pipe to wall or floor. Install thrust-block supports at vertical and horizontal offsets.
1. Install encasement on piping according to ASTM A 674 or AWWA C105/A 21.5.
- V. Install underground, copper, force-main tubing according to CDA's "Copper Tube Handbook."
1. Install encasement on piping according to ASTM A 674 or AWWA C105/A 21.5.
- W. Install force mains at elevations indicated.
- X. Plumbing Specialties:
1. Install backwater valves in sanitary waste gravity-flow piping. Comply with requirements for backwater valves specified in Section 221319 "Sanitary Waste Piping Specialties."
 2. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary drainage gravity-flow piping. Install cleanout fitting with closure plug inside the building in sanitary drainage force-main piping. Comply with requirements for cleanouts specified in Section 221319 "Sanitary Waste Piping Specialties."
 3. Install drains in sanitary drainage gravity-flow piping. Comply with requirements for drains specified in Section 221319 "Sanitary Waste Piping Specialties."
- Y. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
- Z. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

- AA. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- BB. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.3 JOINT CONSTRUCTION

- A. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
- B. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead-and-oakum calked joints.
- C. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
- D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- E. Join stainless-steel pipe and fittings with gaskets according to ASME A112.3.1.
- F. Join copper tube and fittings with soldered joints according to ASTM B 828. Use ASTM B 813, water-flushable, lead-free flux and ASTM B 32, lead-free-alloy solder.
- G. Grooved Joints: Cut groove ends of pipe according to AWWA C606. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections, over gasket, with keys seated in piping grooves. Install and tighten housing bolts.
- H. Flanged Joints: Align bolt holes. Select appropriate gasket material, size, type, and thickness. Install gasket concentrically positioned. Use suitable lubricants on bolt threads. Torque bolts in cross pattern.
- I. Plastic, Nonpressure-Piping, Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
 - 3. PVC Piping: Join according to ASTM D 2855 and ASTM D 2665 Appendixes.

3.4 SPECIALTY PIPE FITTING INSTALLATION

- A. Transition Couplings:

1. Install transition couplings at joints of piping with small differences in OD's.
2. In Drainage Piping: Shielded, nonpressure transition couplings.
3. In Aboveground Force Main Piping: Fitting-type transition couplings.
4. In Underground Force Main Piping:
 - a. NPS 1-1/2 and Smaller: Fitting-type transition couplings.
 - b. NPS 2 and Larger: Pressure transition couplings.

B. Dielectric Fittings:

1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
2. Dielectric Fittings for NPS 2 and Smaller: Use dielectric unions.
3. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges.
4. Dielectric Fittings for NPS 6 and Larger: Use dielectric flange kits.

3.5 VALVE INSTALLATION

- A. General valve installation requirements are specified in Section 220523.12 "Ball Valves for Plumbing Piping," Section 220523.13 "Butterfly Valves for Plumbing Piping," Section 220523.14 "Check Valves for Plumbing Piping," and Section 220523.15 "Gate Valves for Plumbing Piping."

B. Shutoff Valves:

1. Install shutoff valve on each sewage pump discharge.
2. Install gate or full-port ball valve for piping NPS 2 and smaller.
3. Install gate valve for piping NPS 2-1/2 and larger.

- C. Check Valves: Install swing check valve, between pump and shutoff valve, on each sewage pump discharge.

D. Backwater Valves: Install backwater valves in piping subject to backflow.

1. Horizontal Piping: Horizontal backwater valves. Use normally closed type unless otherwise indicated.
2. Floor Drains: Drain outlet backwater valves unless drain has integral backwater valve.
3. Install backwater valves in accessible locations.
4. Comply with requirements for backwater valve specified in Section 221319 "Sanitary Waste Piping Specialties."

3.6 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."

- B. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
2. Install stainless-steel pipe hangers for horizontal piping in corrosive environments.

3. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
 4. Install stainless-steel pipe support clamps for vertical piping in corrosive environments.
 5. Vertical Piping: MSS Type 8 or Type 42, clamps.
 6. Install individual, straight, horizontal piping runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
 7. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 8. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support horizontal piping and tubing within 12 inches of each fitting, valve, and coupling.
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.
- F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
 2. NPS 3: 60 inches with 1/2-inch rod.
 3. NPS 4: 60 inches with 5/8-inch rod.
 4. NPS 6 and NPS 8: 60 inches with 3/4-inch rod.
 5. Spacing for 10-foot lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.
- G. Install supports for vertical cast-iron soil piping every 15 feet.
- H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4: 84 inches with 3/8-inch rod.
 2. NPS 1-1/2: 108 inches with 3/8-inch rod.
 3. NPS 2: 10 feet with 3/8-inch rod.
 4. NPS 2-1/2: 11 feet with 1/2-inch rod.
 5. NPS 3: 12 feet with 1/2-inch rod.
 6. NPS 4: 12 feet with 5/8-inch rod.
 7. NPS 6 and NPS 8: 12 feet with 3/4-inch rod.
- I. Install supports for vertical steel piping every 15 feet.
- J. Install hangers for stainless-steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 2: 84 inches with 3/8-inch rod.
 2. NPS 3: 96 inches with 1/2-inch rod.
 3. NPS 4: 108 inches with 1/2-inch rod.
 4. NPS 6: 10 feet with 5/8-inch rod.

- K. Install supports for vertical stainless-steel piping every 10 feet.
- L. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 - 3. NPS 2-1/2: 108 inches with 1/2-inch rod.
 - 4. NPS 3: 10 feet with 1/2-inch rod.
- M. Install supports for vertical copper tubing every 10 feet.
- N. Install hangers for ABS and PVC piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.
 - 2. NPS 3: 48 inches with 1/2-inch rod.
 - 3. NPS 4: 48 inches with 5/8-inch rod.
 - 4. NPS 6 and NPS 8: 48 inches with 3/4-inch rod.
- O. Install supports for vertical ABS and PVC piping every 48 inches.
- P. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
 - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
 - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
 - 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 - 4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
 - 5. Comply with requirements for cleanouts and drains specified in Section 221319 "Sanitary Waste Piping Specialties."
 - 6. Equipment: Connect drainage piping as indicated. Provide shutoff valve if indicated and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.
- D. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.

E. Make connections according to the following unless otherwise indicated:

1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.8 IDENTIFICATION

- A. Identify exposed sanitary waste and vent piping. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.9 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping except outside leaders on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.

5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 6. Prepare reports for tests and required corrective action.
- E. Test force-main piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 2. Cap and subject piping to static-water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 3. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 4. Prepare reports for tests and required corrective action.

3.10 CLEANING AND PROTECTION

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.
- D. Exposed ABS and PVC Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.

3.11 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground, soil and waste piping NPS 4 and smaller shall be any of the following:
 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Galvanized-steel pipe, drainage fittings, and threaded joints.
 4. Stainless-steel pipe and fittings, sealing rings, and gasketed joints.
 5. Copper DWV tube, copper drainage fittings, and soldered joints.
 6. Solid-wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
 7. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 8. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- C. Aboveground, soil and waste piping NPS 6 and larger shall be any of the following:
 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Galvanized-steel pipe, drainage fittings, and threaded joints.
 4. Stainless-steel pipe and fittings, sealing rings, and gasketed joints.
 5. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 6. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- D. Aboveground, vent piping NPS 4 and smaller shall be any of the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Galvanized-steel pipe, drainage fittings, and threaded joints.
 4. Stainless-steel pipe and fittings gaskets, and gasketed joints.
 5. Copper DWV tube, copper drainage fittings, and soldered joints.
 - a. Option for Vent Piping, NPS 2-1/2 and NPS 3-1/2: Hard copper tube, Type M; copper pressure fittings; and soldered joints.
 6. Solid-wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
 7. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 8. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- E. Underground, soil, waste, and vent piping NPS 4 and smaller shall be any of the following:
1. Service class, cast-iron soil piping; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
 3. Stainless-steel pipe and fittings, gaskets, and gasketed joints.
 4. Solid wall ABS pipe, ABS socket fittings, and solvent-cemented joints.
 5. Solid wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 6. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.
- F. Underground, soil and waste piping NPS 6 and larger shall be any of the following:
1. Service class, cast-iron soil piping; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; coupled joints.
 3. Solid-wall PVC pipe; PVC socket fittings; and solvent-cemented joints.
 4. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.

END OF SECTION 221316

SECTION 221319 - SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. FRP: Fiberglass-reinforced plastic.
- C. HDPE: High-density polyethylene plastic.
- D. PE: Polyethylene plastic.
- E. PP: Polypropylene plastic.
- F. PVC: Polyvinyl chloride plastic.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and accessories for the following:
 - 1. See Plumbing Schedule on drawings.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For drainage piping specialties to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic sanitary piping specialty components.

1.6 COORDINATION

- A. Coordinate size and location of roof penetrations.

PART 2 - PRODUCTS

2.1 SANITARY WASTE PIPING SPECIALTIES

- A. See Schedule on Plumbing Drawings for specialty item, make, model number and description.

2.2 ROOF FLASHING ASSEMBLIES

- A. Roof Flashing Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Acorn Engineering Company; a Division of Morris Group International.
 - b. Thaler Metal Industries Ltd.
 - c. Zurn Industries, LLC.
2. Description: Manufactured assembly made of 4.0-lb/sq. ft., 0.0625-inch-thick, lead flashing collar and skirt extending at least 8 inches from pipe, with galvanized-steel boot reinforcement and counterflashing fitting.
 - a. Open-Top Vent Cap: Without cap.
 - b. Low-Silhouette Vent Cap: With vandal-proof vent cap.
 - c. Extended Vent Cap: With field-installed, vandal-proof vent cap.

2.3 THROUGH-PENETRATION FIRESTOP ASSEMBLIES

- A. Through-Penetration Firestop Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. ProVent Systems.
2. Standard: UL 1479 assembly of sleeve and stack fitting with firestopping plug.
3. Size: Same as connected soil, waste, or vent stack.
4. Sleeve: Molded PVC plastic, of length to match slab thickness and with integral nailing flange on one end for installation in cast-in-place concrete slabs.
5. Stack Fitting: ASTM A 48/A 48M, gray-iron, hubless-pattern, wye branch with neoprene O-ring at base and gray-iron plug in thermal-release harness. Include PVC protective cap for plug.
6. Special Coating: Corrosion resistant on interior of fittings.

2.4 FLASHING MATERIALS

- A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:
 - 1. General Use: 4.0-lb/sq. ft., 0.0625-inch thickness.
 - 2. Vent Pipe Flashing: 3.0-lb/sq. ft., 0.0469-inch thickness.
 - 3. Burning: 6-lb/sq. ft., 0.0938-inch thickness.
- B. Copper Sheet: ASTM B 152/B 152M, of the following minimum weights and thicknesses, unless otherwise indicated:
 - 1. General Applications: 12 oz./sq. ft.
 - 2. Vent Pipe Flashing: 8 oz./sq. ft.
- C. Zinc-Coated Steel Sheet: ASTM A 653/A 653M, with 0.20 percent copper content and 0.04-inch minimum thickness, unless otherwise indicated. Include G90 hot-dip galvanized, mill-phosphatized finish for painting if indicated.
- D. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil minimum thickness.
- E. Fasteners: Metal compatible with material and substrate being fastened.
- F. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.
- G. Solder: ASTM B 32, lead-free alloy.
- H. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
 - 1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
 - 2. Locate at each change in direction of piping greater than 45 degrees.
 - 3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
 - 4. Locate at base of each vertical soil and waste stack.
- B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

- D. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
 - 1. Position floor drains for easy access and maintenance.
 - 2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
 - a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
 - b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
 - c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.
 - 3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
 - 4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- E. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.
- F. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.
- G. Install through-penetration firestop assemblies in plastic conductors and stacks at floor penetrations.
- H. Assemble open drain fittings and install with top of hub 2 inches above floor.
- I. Install deep-seal traps on floor drains and other waste outlets, if indicated.
- J. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.
 - 1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
 - 2. Size: Same as floor drain inlet.
- K. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.
- L. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.
- M. Install wood-blocking reinforcement for wall-mounting-type specialties.
- N. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.2 CONNECTIONS

- A. Comply with requirements in Section 221316 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.

- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- D. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.3 FLASHING INSTALLATION

- A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
 - 1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft., 0.0938-inch thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft., 0.0625-inch thickness or thinner.
 - 2. Copper Sheets: Solder joints of copper sheets.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
 - 1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
 - 2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
 - 3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.
- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Section 076200 "Sheet Metal Flashing and Trim."
- F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.
- G. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.4 LABELING AND IDENTIFYING

- A. Inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.5 FIELD QUALITY CONTROL

- A. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.6 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221319

SECTION 221413 - FACILITY STORM DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe, tube, and fittings.
 - 2. Specialty pipe fittings.
- B. Related Sections:
 - 1. Section 334100 "Storm Utility Drainage Piping" for storm drainage piping outside the building.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF/ANSI 14, "Plastics Piping System Components and Related Materials," for plastic piping components. Include marking with "NSF-drain" for plastic drain piping and "NSF-sewer" for plastic sewer piping.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Storm-Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
 - 1. Notify Construction Manager no fewer than two days in advance of proposed interruption of storm-drainage service.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. CISPI, Hubless-Piping Couplings:
 - 1. Standards: ASTM C 1277 and CISPI 310.
 - 2. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
- C. Heavy-Duty, Hubless-Piping Couplings:
 - 1. Standards: ASTM C 1277 and ASTM C 1540.
 - 2. Description: Stainless-steel shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
- D. Cast-Iron, Hubless-Piping Couplings:
 - 1. Standard: ASTM C 1277.
 - 2. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.3 PVC PIPE AND FITTINGS

- A. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
- B. Cellular-Core PVC Pipe: ASTM F 891, Schedule 40.
- C. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.
- D. Adhesive Primer: ASTM F 656.
 - 1. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Solvent Cement: ASTM D 2564.
 - 1. PVC solvent cement shall have a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 SPECIALTY PIPE FITTINGS

A. Transition Couplings:

1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.
2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified-piping-system fitting.
3. Unshielded, Nonpressure Transition Couplings:
 - a. Standard: ASTM C 1173.
 - b. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
 - c. Sleeve Materials:
 - 1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
 - 2) For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 - 3) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
4. Shielded, Nonpressure Transition Couplings:
 - a. Standard: ASTM C 1460.
 - b. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

PART 3 - EXECUTION

3.1 EARTH MOVING

- A. Comply with requirements for excavating, trenching, and backfilling specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations from layout are approved on coordination drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping at indicated slopes.
- F. Install piping free of sags and bends.
- G. Install fittings for changes in direction and branch connections.
- H. Install piping to allow application of insulation.
- I. Make changes in direction for storm drainage piping using appropriate branches, bends, and long-sweep bends. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- J. Lay buried building storm drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- K. Install storm drainage piping at the following minimum slopes unless otherwise indicated:
 - 1. Building Storm Drain and Horizontal Storm-Drainage Piping: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
- L. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Install encasement on underground piping according to ASTM A 674 or AWWA C105.
- M. Install aboveground PVC piping according to ASTM D 2665.
- N. Install underground PVC piping according to ASTM D 2321.
- O. Plumbing Specialties:
 - 1. Install backwater valves in storm drainage gravity-flow piping. Comply with requirements for backwater valves specified in Section 221423 "Storm Drainage Piping Specialties."
 - 2. Install cleanouts at grade and extend to where building storm drains connect to building storm sewers in storm drainage gravity-flow piping. Install cleanout fitting with closure plug inside the building in storm drainage force-main piping. Comply with requirements for cleanouts specified in Section 221423 "Storm Drainage Piping Specialties."
 - 3. Install drains in storm drainage gravity-flow piping. Comply with requirements for drains specified in Section 221423 "Storm Drainage Piping Specialties."

- P. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
- Q. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- R. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- S. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.3 JOINT CONSTRUCTION

- A. Hubless, Cast-Iron Soil Piping Coupled Joints: Join according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
- B. Plastic, Nonpressure-Piping, Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
 - 3. PVC Piping: Join according to ASTM D 2855 and ASTM D 2665 Appendixes.

3.4 SPECIALTY PIPE FITTING INSTALLATION

- A. Transition Couplings:
 - 1. Install transition couplings at joints of piping with small differences in OD's.
 - 2. In Drainage Piping: Unshielded or Shielded, nonpressure transition couplings.

3.5 VALVE INSTALLATION

- A. Backwater Valves: Install backwater valves in piping subject to backflow.
 - 1. Horizontal Piping: Horizontal backwater valves. Use normally closed type unless otherwise indicated.
 - 2. Install backwater valves in accessible locations.
 - 3. Comply with requirements for backwater valves specified in Section 221423 "Storm Drainage Piping Specialties."

3.6 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
 2. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
 3. Vertical Piping: MSS Type 8 or Type 42, clamps.
 4. Individual, Straight, Horizontal Piping Runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 5. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 6. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Support horizontal piping and tubing within 12 inches of each fitting and coupling.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.
- E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
 2. NPS 3: 60 inches with 1/2-inch rod.
 3. NPS 4: 60 inches with 5/8-inch rod.
 4. NPS 6 and NPS 8: 60 inches with 3/4-inch rod.
 5. Spacing for 10-foot pipe lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.
- F. Install supports for vertical cast-iron soil piping every 15 feet.
- G. Install hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.
 2. NPS 3: 48 inches with 1/2-inch rod.
 3. NPS 4: 48 inches with 5/8-inch rod.
 4. NPS 6 and NPS 8: 48 inches with 3/4-inch rod.
- H. Install supports for vertical PVC piping every 48 inches.
- I. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.
- 3.7 CONNECTIONS
- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect interior storm drainage piping to exterior storm drainage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect storm drainage piping to roof drains and storm drainage specialties.

1. Install test tees (wall cleanouts) in conductors near floor, and floor cleanouts with cover flush with floor.
 2. Install horizontal backwater valves with cleanout cover flush with floor.
 3. Comply with requirements for backwater valves, cleanouts and drains specified in Section 221423 "Storm Drainage Piping Specialties."
- D. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.

3.8 IDENTIFICATION

- A. Identify exposed storm drainage piping. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.9 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in.
 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test storm drainage piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced storm drainage piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Test Procedure: Test storm drainage piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts until completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 5. Prepare reports for tests and required corrective action.

3.10 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.11 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground storm drainage piping shall be any of the following:
 - 1. Hubless, cast-iron soil pipe and fittings; CISPI, hubless-piping couplings; and coupled joints.
 - 2. Solid-wall or Cellular-core PVC pipe, PVC socket fittings, and solvent-cemented joints.
 - 3. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.
- C. Underground storm drainage piping shall be any the following:
 - 1. Hubless, cast-iron soil pipe and fittings; heavy-duty, hubless-piping couplings; and coupled joints.
 - 2. Solid-wall or Cellular-core PVC pipe, PVC socket fittings, and solvent-cemented joints.
 - 3. Dissimilar Pipe-Material Couplings: Unshielded or Shielded, nonpressure transition couplings.

END OF SECTION 221413

SECTION 221423 - STORM DRAINAGE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof drains.
 - 2. Cleanouts.
 - 3. Flashing materials.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 ROOF DRAINS

- A. See Fixture Specifications schedule on plumbing drawings for roof drain and cleanout descriptions.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions.
 - 1. Install flashing collar or flange of roof drain to prevent leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.

2. Install expansion joints, if indicated, in roof drain outlets.
 3. Position roof drains for easy access and maintenance.
- B. Install downspout adapters on outlet of back-outlet parapet roof drains and connect to sheet metal downspouts.
- C. Install cleanouts in aboveground piping and building drain piping according to the following instructions unless otherwise indicated:
1. Use cleanouts the same size as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
 2. Locate cleanouts at each change in direction of piping greater than 45 degrees.
 3. Locate cleanouts at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
 4. Locate cleanouts at base of each vertical soil and waste stack.
- D. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- E. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
- F. Install horizontal backwater valves in floor with cover flush with floor.
- G. Install wall cleanouts in vertical conductors. Install access door in wall if indicated.
- H. Install through-penetration firestop assemblies in plastic conductors at concrete floor penetrations.
- I. Install sleeve flashing device with each conductor passing through floors with waterproof membrane.

3.2 CONNECTIONS

- A. Comply with requirements for piping specified in Section 221413 "Facility Storm Drainage Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

3.3 FLASHING INSTALLATION

- A. Fabricate flashing from single piece of metal unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
1. Lead Sheets: Burn joints of 6.0-lb/sq. ft. lead sheets, 0.0938-inch thickness or thicker. Solder joints of 4.0-lb/sq. ft. lead sheets, 0.0625-inch thickness or thinner.
 2. Copper Sheets: Solder joints of copper sheets.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching the pipe size, with a minimum length of 10 inches and with skirt or flange extending at least 8 inches around pipe.
2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.

- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.4 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221423

SECTION 223300 - ELECTRIC, DOMESTIC-WATER HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Commercial, light-duty, storage, electric, domestic-water heaters.
 - 2. Domestic-water heater accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type and size of domestic-water heater indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings:
 - 1. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of commercial, electric, domestic-water heater, from manufacturer.
- B. Domestic-Water Heater Labeling: Certified and labeled by testing agency acceptable to authorities having jurisdiction.
- C. Source quality-control reports.
- D. Field quality-control reports.
- E. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For electric, domestic-water heaters to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.
- C. ASME Compliance: Where ASME-code construction is indicated, fabricate and label commercial, domestic-water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
- D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61 Annex G, "Drinking Water System Components - Health Effects."

1.7 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of electric, domestic-water heaters that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including storage tank and supports.
 - b. Faulty operation of controls.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal use.
 - 2. Warranty Periods: From date of Substantial Completion.
 - a. Commercial, Light-Duty, Storage, Electric, Domestic-Water Heaters:
 - 1) Storage Tank: Three years.
 - 2) Controls and Other Components: Three years.
 - b. Compression Tanks: Five years.

PART 2 - PRODUCTS

- A. Commercial, Light-Duty, Storage, Electric, Domestic-Water Heaters:
 - 1. See Electric Water Heater Schedule on plumbing drawings for Electric Domestic-Water Heaters make, model number and description.

2.2 DOMESTIC-WATER HEATER ACCESSORIES

A. Domestic-Water Compression Tanks:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A.O. Smith Corporation.
 - b. AMTROL, Inc.
 - c. Flexcon Industries.
 - d. Honeywell.
 - e. Pentair Pump Group.
 - f. State Industries.
 - g. TACO Comfort Solutions, Inc.
2. Description: Steel pressure-rated tank constructed with welded joints and factory-installed butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.
3. Construction:
 - a. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.
 - b. Interior Finish: Comply with NSF 61 Annex G barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.
 - c. Air-Charging Valve: Factory installed.
4. Capacity and Characteristics:
 - a. Working-Pressure Rating: 100 psig.
 - b. Capacity Acceptable: 2 gal. and 4 gal. minimum or as scheduled on drawings.
 - c. Air Precharge Pressure: Precharge equal to static supply pressure.

B. Drain Pans: Corrosion-resistant metal with raised edge. Comply with ANSI/CSA LC 3. Include dimensions not less than base of domestic-water heater, and include drain outlet not less than NPS 3/4 with ASME B1.20.1 pipe threads or with ASME B1.20.7 garden-hose threads.

C. Piping-Type Heat Traps: Field-fabricated piping arrangement according to ASHRAE/IESNA 90.1.

D. Heat-Trap Fittings: ASHRAE 90.2.

E. Manifold Kits: Domestic-water heater manufacturer's factory-fabricated inlet and outlet piping for field installation, for multiple domestic-water heater installation. Include ball-type shutoff valves to isolate each domestic-water heater and calibrated balancing valves to provide balanced flow through each domestic-water heater.

1. Comply with requirements for ball-type shutoff valves specified in Section 220523.12 "Ball Valves for Plumbing Piping."
2. Comply with requirements for balancing valves specified in Section 221119 "Domestic Water Piping Specialties."

- F. Pressure-Reducing Valves: ASSE 1003 for water. Set at 25-psig- maximum outlet pressure unless otherwise indicated.
- G. Combination Temperature-and-Pressure Relief Valves: ASME rated and stamped. Include relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select relief valves with sensing element that extends into storage tank.
- H. Pressure Relief Valves: ASME rated and stamped. Include pressure setting less than domestic-water heater working-pressure rating.
- I. Vacuum Relief Valves: ANSI Z21.22/CSA 4.4.
- J. Shock Absorbers: ASSE 1010 or PDI-WH 201, Size A water hammer arrester.
- K. Domestic-Water Heater Stands: Manufacturer's factory-fabricated steel stand for floor mounting, capable of supporting domestic-water heater and water. Include dimension that will support bottom of domestic-water heater a minimum of 18 inches above the floor.
- L. Domestic-Water Heater Mounting Brackets: Manufacturer's factory-fabricated steel bracket for wall mounting, capable of supporting domestic-water heater and water.

2.3 SOURCE QUALITY CONTROL

- A. Factory Tests: Test and inspect domestic-water heaters specified to be ASME-code construction, according to ASME Boiler and Pressure Vessel Code.
- B. Hydrostatically test commercial domestic-water heaters to minimum of one and one-half times pressure rating before shipment.
- C. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 014000 "Quality Requirements" for retesting and reinspecting requirements and Section 017300 "Execution" for requirements for correcting the Work.
- D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 DOMESTIC-WATER HEATER INSTALLATION

- A. Commercial, Electric, Domestic-Water Heater Mounting: Install commercial, electric, domestic-water heaters on concrete base.
 - 1. Exception: Omit concrete bases for commercial, electric, domestic-water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.
 - 2. Maintain manufacturer's recommended clearances.
 - 3. Arrange units so controls and devices that require servicing are accessible.

4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 6. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 7. Install anchor bolts to elevations required for proper attachment to supported equipment.
 8. Anchor domestic-water heaters to substrate.
- B. Install electric, domestic-water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.
1. Install shutoff valves on domestic-water-supply piping to domestic-water heaters and on domestic-hot-water outlet piping. Comply with requirements for shutoff valves specified in Section 220523.12 "Ball Valves for Plumbing Piping."
- C. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.
- D. Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for electric, domestic-water heaters that do not have tank drains. Comply with requirements for hose-end drain valves specified in Section 221119 "Domestic Water Piping Specialties."
- E. Install thermometers on outlet piping of electric, domestic-water heaters. Comply with requirements for thermometers specified in Section 220519 "Meters and Gages for Plumbing Piping."
- F. Install thermometers on inlet and outlet piping of electric, domestic-water heaters. Comply with requirements for thermometers specified in Section 220519 "Meters and Gages for Plumbing Piping."
- G. Install piping-type heat traps on inlet and outlet piping of electric, domestic-water heater storage tanks without integral or fitting-type heat traps.
- H. Fill electric, domestic-water heaters with water.
- I. Charge domestic-water compression tanks with air.
- 3.2 CONNECTIONS
- A. Comply with requirements for piping specified in Section 221116 "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where installing piping adjacent to electric, domestic-water heaters, allow space for service and maintenance of water heaters. Arrange piping for easy removal of domestic-water heaters.

3.3 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
 - 2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 014000 "Quality Requirements" for retesting and reinspecting requirements and Section 017300 "Execution" for requirements for correcting the Work.
- C. Prepare test and inspection reports.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain commercial, electric, domestic-water heaters.

END OF SECTION 223300

SECTION 224213.13 - COMMERCIAL WATER CLOSETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Water closets.
 - 2. Toilet seats.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for water closets.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For water closets to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 FLOOR-MOUNTED, BOTTOM-OUTLET FLUSH TANK WATER CLOSETS

- A. See Fixture Specifications schedule on plumbing drawings for water closets make, model and description.

2.2 TOILET SEATS

- A. Toilet Seats:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Standard.

- b. Bemis Manufacturing Company.
 - c. Centoco Manufacturing Corporation.
 - d. Church Seats; Bemis Manufacturing Company.
 - e. Jones Stephens Corp.
 - f. Kohler Co.
 - g. Olsonite Seat Co.
 - h. Sanderson Plumbing Products, Inc.
 - i. Sperzel of Lexington.
 - j. TOTO USA, INC.
 - k. Zurn Industries LLC.
- 2. Standard: IAPMO/ANSI Z124.5.
 - 3. Material: Plastic.
 - 4. Type: Commercial (Heavy Duty).
 - 5. Shape: Elongated rim, open front.
 - 6. Hinge: Self-sustaining.
 - 7. Hinge Material: Noncorroding metal.
 - 8. Seat Cover: Not required.
 - 9. Color: White.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before water-closet installation.
- B. Examine walls and floors for suitable conditions where water closets will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Water-Closet Installation:
 - 1. Install level and plumb according to roughing-in drawings.
 - 2. Install floor-mounted water closets on bowl-to-drain connecting fitting attachments to piping or building substrate.
 - 3. Install accessible, wall-mounted water closets at mounting height for handicapped/elderly, according to ICC/ANSI A117.1.
- B. Flush Tank Lever Installation:
 - 1. Install flush tank angle supply stop valve, water-supply fitting on each supply to each water closet.
 - 2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
 - 3. Install flush tank lever-handle for accessible water closets with handle located on open side of water closet.

C. Install toilet seats on water closets.

D. Wall Flange and Escutcheon Installation:

1. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations and within cabinets and millwork.
2. Install deep-pattern escutcheons if required to conceal protruding fittings.
3. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."

E. Joint Sealing:

1. Seal joints between water closets and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
2. Match sealant color to water-closet color.
3. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

3.3 CONNECTIONS

- A. Connect water closets with water supplies and soil, waste, and vent piping. Use size fittings required to match water closets.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."
- D. Where installing piping adjacent to water closets, allow space for service and maintenance.

3.4 ADJUSTING

- A. Operate and adjust water closets and controls. Replace damaged and malfunctioning water closets, fittings, and controls.
- B. Adjust water pressure at flushometer valves to produce proper flow.

3.5 CLEANING AND PROTECTION

- A. Clean water closets and fittings with manufacturers' recommended cleaning methods and materials.
- B. Install protective covering for installed water closets and fittings.
- C. Do not allow use of water closets for temporary facilities unless approved in writing by Owner.

END OF SECTION 224213.13

SECTION 224213.16 - COMMERCIAL URINALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Urinals.
 - 2. Flushometer valves.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for urinals.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For urinals and flushometer valves to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 WALL-HUNG URINALS

- A. See Fixture Specifications schedule on plumbing drawings for urinals make, model and description.

2.2 URINAL FLUSHOMETER VALVES

- A. Lever-Handle, Piston Flushometer Valves:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Standard.

- b. Delany Products.
 - c. Kohler Co.
 - d. Sloan Valve Company.
 - e. TOTO USA, INC.
 - f. Zurn Industries, LLC.
- 2. Standard: ASSE 1037.
 - 3. Minimum Pressure Rating: 125 psig.
 - 4. Features: Include integral check stop and backflow-prevention device.
 - 5. Material: Brass body with corrosion-resistant components.
 - 6. Exposed Flushometer-Valve Finish: Chrome plated.
 - 7. Panel Finish: Chrome plated or stainless steel.
 - 8. Style: Exposed.
 - 9. Consumption: 0.5 gal. per flush.
 - 10. Minimum Inlet: NPS 3/4.
 - 11. Minimum Outlet: NPS 3/4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before urinal installation.
- B. Examine walls and floors for suitable conditions where urinals will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Urinal Installation:
 - 1. Install urinals level and plumb according to roughing-in drawings.
 - 2. Install wall-hung, back-outlet urinals onto waste fitting seals and attached to supports.
 - 3. Install accessible, wall-mounted urinals at mounting height for the handicapped/elderly, according to ICC/ANSI A117.1.
- B. Support Installation:
 - 1. Install supports, affixed to building substrate, for wall-hung urinals.
 - 2. Use off-floor carriers with waste fitting and seal for back-outlet urinals.
 - 3. Use carriers without waste fitting for urinals with tubular waste piping.
 - 4. Use chair-type carrier supports with rectangular steel uprights for accessible urinals.
- C. Flushometer-Valve Installation:
 - 1. Install flushometer-valve water-supply fitting on each supply to each urinal.
 - 2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.

3. Install lever-handle flushometer valves for accessible urinals with handle mounted on open side of compartment.

D. Wall Flange and Escutcheon Installation:

1. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations.
2. Install deep-pattern escutcheons if required to conceal protruding fittings.
3. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."

E. Joint Sealing:

1. Seal joints between urinals and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
2. Match sealant color to urinal color.
3. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

3.3 CONNECTIONS

- A. Connect urinals with water supplies and soil, waste, and vent piping. Use size fittings required to match urinals.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."
- D. Where installing piping adjacent to urinals, allow space for service and maintenance.

3.4 ADJUSTING

- A. Operate and adjust urinals and controls. Replace damaged and malfunctioning urinals, fittings, and controls.
- B. Adjust water pressure at flushometer valves to produce proper flow.

3.5 CLEANING AND PROTECTION

- A. Clean urinals and fittings with manufacturers' recommended cleaning methods and materials.
- B. Install protective covering for installed urinals and fittings.
- C. Do not allow use of urinals for temporary facilities unless approved in writing by Owner.

END OF SECTION 224213.16

SECTION 224216.13 - COMMERCIAL LAVATORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Lavatories.
 - 2. Supply fittings.
 - 3. Waste fittings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for lavatories.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Counter cutout templates for mounting of counter-mounted lavatories.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For lavatories and faucets to include in operation and maintenance manuals.
 - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Servicing and adjustments of automatic faucets.

PART 2 - PRODUCTS

2.1 COMMERCIAL LAVATORIES

- A. See Fixture Specifications schedule on plumbing drawings for lavatory type, make, model and description.

2.2 SUPPLY FITTINGS

- A. NSF Standard: Comply with NSF/ANSI 61 Annex G, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.
- B. Standard: ASME A112.18.1/CSA B125.1.
- C. Supply Piping: Chrome-plated-brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated-brass or stainless-steel wall flange.
- D. Supply Stops: Chrome-plated-brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
- E. Operation: Loose key.
- F. Risers:
 - 1. NPS 3/8.
 - 2. ASME A112.18.6, braided- or corrugated-stainless-steel, flexible hose riser.

2.3 WASTE FITTINGS

- A. Standard: ASME A112.18.2/CSA B125.2.
- B. Drain: Grid type with NPS 1-1/4 offset and straight tailpiece.
- C. Trap:
 - 1. Size: NPS 1-1/2 by NPS 1-1/4.
 - 2. Material: Chrome-plated, two-piece, cast-brass trap and swivel elbow with 0.032-inch-thick brass tube to wall; and chrome-plated, brass or steel wall flange.
 - 3. Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch-thick stainless-steel tube to wall; and stainless-steel wall flange.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before lavatory installation.

- B. Examine counters and walls for suitable conditions where lavatories will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install lavatories level and plumb according to roughing-in drawings.
- B. Install supports, affixed to building substrate, for wall-mounted lavatories.
- C. Install accessible wall-mounted lavatories at handicapped/elderly mounting height for people with disabilities or the elderly, according to ICC/ANSI A117.1.
- D. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."
- E. Seal joints between lavatories, counters, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."
- F. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible lavatories. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

3.3 CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

- A. Operate and adjust lavatories and controls. Replace damaged and malfunctioning lavatories, fittings, and controls.
- B. Adjust water pressure at faucets to produce proper flow.

3.5 CLEANING AND PROTECTION

- A. After completing installation of lavatories, inspect and repair damaged finishes.
- B. Clean lavatories, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.

- C. Provide protective covering for installed lavatories and fittings.
- D. Do not allow use of lavatories for temporary facilities unless approved in writing by Owner.

END OF SECTION 224216.13

SECTION 224216.16 - COMMERCIAL SINKS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Sinks.
2. Service Sinks.
3. Supply fittings.
4. Waste fittings.
5. Grout.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for sinks.
 2. Include rated capacities, operating characteristics and furnished specialties and accessories.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Counter cutout templates for mounting of counter-mounted lavatories.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sinks to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 COMMERCIAL SINKS

- A. See Fixture Specifications schedule on plumbing drawings for sink type, make, model and description.

2.2 SERVICE SINKS

- A. See Fixture Specifications schedule on plumbing drawings for service sink make, model and description.

2.3 SUPPLY FITTINGS

- A. NSF Standard: Comply with NSF/ANSI 61 Annex G, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.
- B. Standard: ASME A112.18.1/CSA B125.1.
- C. Supply Piping: Chrome-plated brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated brass or stainless-steel wall flange.
- D. Supply Stops: Chrome-plated brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
- E. Operation: Loose key.
- F. Risers:
 - 1. NPS 1/2
 - 2. ASME A112.18.6, braided or corrugated stainless-steel flexible hose.

2.4 WASTE FITTINGS

- A. Standard: ASME A112.18.2/CSA B125.2.
- B. Drain: Grid type with NPS 1-1/2 offset and straight tailpiece.
- C. Trap:
 - 1. Size: NPS 1-1/2.
 - 2. Material: Chrome-plated, two-piece, cast-brass trap and swivel elbow with 0.032-inch-thick brass tube to wall; and chrome-plated brass or steel wall flange.
 - 3. Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch-thick stainless-steel tube to wall; and stainless-steel wall flange.

2.5 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before sink installation.
- B. Examine walls, floors, and counters for suitable conditions where sinks will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install sinks level and plumb according to roughing-in drawings.
- B. Install supports, affixed to building substrate, for wall-hung sinks.
- C. Install accessible wall-mounted sinks at handicapped/elderly mounting height according to ICC/ANSI A117.1.
- D. Set floor-mounted sinks in leveling bed of cement grout.
- E. Install water-supply piping with stop on each supply to each sink faucet.
 - 1. Exception: Use ball valves if supply stops are not specified with sink. Comply with valve requirements specified in Section 220523.12 "Ball Valves for Plumbing Piping".
 - 2. Install stops in locations where they can be easily reached for operation.
- F. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."
- G. Seal joints between sinks and counters, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."
- H. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

3.3 CONNECTIONS

- A. Connect sinks with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

- A. Operate and adjust sinks and controls. Replace damaged and malfunctioning sinks, fittings, and controls.
- B. Adjust water pressure at faucets to produce proper flow.

3.5 CLEANING AND PROTECTION

- A. After completing installation of sinks, inspect and repair damaged finishes.
- B. Clean sinks, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
- C. Provide protective covering for installed sinks and fittings.
- D. Do not allow use of sinks for temporary facilities unless approved in writing by Owner.

END OF SECTION 224216.16

SECTION 224223 - COMMERCIAL SHOWERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Showers.
 - 2. Shower faucets.
 - 3. Grout.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for showers.
 - 2. Include rated capacities, operating characteristics, and furnished specialties and accessories.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For shower faucets to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 COMMERCIAL SHOWERS

- A. See Fixture Specifications schedule on plumbing drawings for shower make, model and description.
- B. Coordinate shower construction type with architectural drawings.

2.2 SHOWER FAUCETS

- A. NSF Standard: Comply with NSF 61 Annex G, "Drinking Water System Components - Health Effects," for shower materials that will be in contact with potable water.

- B. See Fixture Specifications schedule on plumbing drawings for shower faucet make, model and description.

2.3 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water-supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before shower installation.
- B. Examine walls and floors for suitable conditions where showers will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Assemble shower components according to manufacturers' written instructions.
- B. Install showers level and plumb according to roughing-in drawings.
- C. Install water-supply piping with stop on each supply to each shower faucet.
 - 1. Exception: Use ball valves if supply stops are not specified with shower. Comply with valve requirements specified in Section 220523.12 "Ball Valves for Plumbing Piping."
 - 2. Install stops in locations where they can be easily reached for operation.
- D. Install shower flow-control fittings with specified maximum flow rates in shower arms.
- E. Set shower receptors in leveling bed of cement grout.
- F. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheons requirements specified in Section 220518 "Escutcheons for Plumbing Piping."
- G. Seal joints between showers and floors and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

3.3 CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with traps and soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

- A. Operate and adjust showers and controls. Replace damaged and malfunctioning showers, fittings, and controls.
- B. Adjust water pressure at faucets to produce proper flow.

3.5 CLEANING AND PROTECTION

- A. After completing installation of showers, inspect and repair damaged finishes.
- B. Clean showers, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
- C. Provide protective covering for installed fixtures and fittings.
- D. Do not allow use of showers for temporary facilities unless approved in writing by Owner.

END OF SECTION 224223

SECTION 224716 - PRESSURE WATER COOLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes pressure water coolers and related components.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of pressure water cooler.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: Include diagrams for power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For pressure water coolers to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 PRESSURE WATER COOLERS

- A. See Fixture Specifications schedule on plumbing drawings for pressure water cooler make, model and description.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for water-supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before fixture installation.

- B. Examine walls and floors for suitable conditions where fixtures will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install fixtures level and plumb according to roughing-in drawings. For fixtures indicated for children, install at height required by authorities having jurisdiction.
- B. Set freestanding pressure water coolers on floor.
- C. Install off-the-floor carrier supports, affixed to building substrate, for wall-mounted fixtures.
- D. Install mounting frames, affixed to building construction, and attach recessed, pressure water coolers to mounting frames.
- E. Install water-supply piping with shutoff valve on supply to each fixture to be connected to domestic-water distribution piping. Use ball valve. Install valves in locations where they can be easily reached for operation. Valves are specified in Section 220523.12 "Ball Valves for Plumbing Piping."
- F. Install trap and waste piping on drain outlet of each fixture to be connected to sanitary drainage system.
- G. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons where required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."
- H. Seal joints between fixtures and walls using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

3.3 CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Install ball shutoff valve on water supply to each fixture or upstream from filter for water cooler. Comply with valve requirements specified in Section 220523.12 "Ball Valves for Plumbing Piping."
- D. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

- A. Adjust fixture flow regulators for proper flow and stream height.

- B. Adjust pressure water-cooler temperature settings.

3.5 CLEANING

- A. After installing fixture, inspect unit. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.
- B. Clean fixtures, on completion of installation, according to manufacturer's written instructions.
- C. Provide protective covering for installed fixtures.
- D. Do not allow use of fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 224716

SECTION 230130.51 - HVAC AIR-DISTRIBUTION SYSTEM CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cleaning HVAC air-distribution equipment, ducts, plenums, and system components.

1.3 DEFINITIONS

- A. ASCS: Air systems cleaning specialist.
- B. NADCA: National Air Duct Cleaners Association.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For an ASCS.
- B. Strategies and procedures plan.
- C. Cleanliness verification report.

1.5 QUALITY ASSURANCE

- A. ASCS Qualifications: A certified member of NADCA.
 - 1. Supervisor Qualifications: Certified as an ASCS by NADCA.
- B. UL Compliance: Comply with UL 181 and UL 181A for fibrous-glass ducts.
- C. Cleaning Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to HVAC air-distribution system cleaning including, but not limited to, review of the cleaning strategies and procedures plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine HVAC air-distribution equipment, ducts, plenums, and system components to determine appropriate methods, tools, and equipment required for performance of the Work.
- B. Perform "Project Evaluation and Recommendation" according to NADCA ACR 2006.
- C. Prepare written report listing conditions detrimental to performance of the Work.
- D. Proceed with work only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare a written plan that includes strategies and step-by-step procedures. At a minimum, include the following:
 - 1. Supervisor contact information.
 - 2. Work schedule including location, times, and impact on occupied areas.
 - 3. Methods and materials planned for each HVAC component type.
 - 4. Required support from other trades.
 - 5. Equipment and material storage requirements.
 - 6. Exhaust equipment setup locations.
- B. Use the existing service openings, as required for proper cleaning, at various points of the HVAC system for physical and mechanical entry and for inspection.
- C. Comply with NADCA ACR 2006, "Guidelines for Constructing Service Openings in HVAC Systems" Section.

3.3 CLEANING

- A. Comply with NADCA ACR 2006.
- B. Remove visible surface contaminants and deposits from within the HVAC system.
- C. Systems and Components to Be Cleaned:
 - 1. Air devices for supply and return air.
 - 2. Ductwork:
 - a. Supply-air ducts, including turning vanes and reheat coils, to the air-handling unit.
 - b. Return-air ducts to the air-handling unit.
 - c. Exhaust-air ducts.

3. Air-Handling Units:
 - a. Interior surfaces of the unit casing.
 - b. Coil surfaces compartment.
 - c. Condensate drain pans.
 - d. Fans, fan blades, and fan housings.
4. Filters and filter housings.
- D. Collect debris removed during cleaning. Ensure that debris is not dispersed outside the HVAC system during the cleaning process.
- E. Particulate Collection:
 1. For particulate collection equipment, include adequate filtration to contain debris removed. Locate equipment downwind and away from all air intakes and other points of entry into the building.
- F. Control odors and mist vapors during the cleaning and restoration process.
- G. Mark the position of manual volume dampers and air-directional mechanical devices inside the system prior to cleaning. Restore them to their marked position on completion of cleaning.
- H. System components shall be cleaned so that all HVAC system components are visibly clean. On completion, all components must be returned to those settings recorded just prior to cleaning operations.
- I. Clean all air-distribution devices, registers, grilles, and diffusers.
- J. Clean visible surface contamination deposits according to NADCA ACR 2006 and the following:
 1. Clean air-handling units, airstream surfaces, components, condensate collectors, and drains.
 2. Ensure that a suitable operative drainage system is in place prior to beginning wash-down procedures.
 3. Clean evaporator coils, reheat coils, and other airstream components.
- K. Duct Systems:
 1. Mechanically clean duct systems specified to remove all visible contaminants so that the systems are capable of passing the HVAC System Cleanliness Tests (see NADCA ACR 2006).
- L. Debris removed from the HVAC system shall be disposed of according to applicable Federal, state, and local requirements.
- M. Mechanical Cleaning Methodology:
 1. Source-Removal Cleaning Methods: The HVAC system shall be cleaned using source-removal mechanical cleaning methods designed to extract contaminants from within the HVAC system and to safely remove these contaminants from the facility. No cleaning

method, or combination of methods, shall be used that could potentially damage components of the HVAC system or negatively alter the integrity of the system.

- a. Use continuously operating vacuum-collection devices to keep each section being cleaned under negative pressure.
 - b. Cleaning methods that require mechanical agitation devices to dislodge debris that is adhered to interior surfaces of HVAC system components shall be equipped to safely remove these devices. Cleaning methods shall not damage the integrity of HVAC system components or damage porous surface materials such as duct and plenum liners.
2. Cleaning Mineral-Fiber Insulation Components:
- a. Cleaning methods used shall not cause damage to fibrous-glass components and will render the system capable of passing the HVAC System Cleanliness Tests (see NADCA ACR 2006).
 - b. Fibrous materials that become wet shall be discarded and replaced.

N. Coil Cleaning:

1. Measure static-pressure differential across each coil.
2. See NADCA ACR 2006, "Coil Surface Cleaning" Section. Type 1, or Type 1 and Type 2, cleaning methods shall be used to render the coil visibly clean and capable of passing Coil Cleaning Verification (see applicable NADCA ACR 2006).
3. Coil drain pans shall be subject to NADCA ACR 2006, "Non-Porous Surfaces Cleaning Verification." Ensure that condensate drain pans are operational.
4. Electric-resistance coils shall be de-energized, locked out, and tagged before cleaning.
5. Cleaning methods shall not cause any appreciable damage to, cause displacement of, inhibit heat transfer, or cause erosion of the coil surface or fins, and shall comply with coil manufacturer's written recommendations when available.
6. Rinse thoroughly with clean water to remove any latent residues.

3.4 CLEANLINESS VERIFICATION

- A. Verify cleanliness according to NADCA ACR 2006, "Verification of HVAC System Cleanliness" Section.
- B. Perform visual inspection for cleanliness. If no contaminants are evident through visual inspection, the HVAC system shall be considered clean. If visible contaminants are evident through visual inspection, those portions of the system where contaminants are visible shall be re-cleaned and subjected to re-inspection for cleanliness.
- C. Verification of Coil Cleaning:
1. Measure static-pressure differential across each coil.
 2. Coil will be considered clean if cleaning restored the coil static-pressure differential within 10 percent of the differential measured when the coil was first installed.
 3. Coil will be considered clean if the coil is free of foreign matter and chemical residue, based on a thorough visual inspection.
- D. Prepare a written cleanliness verification report. At a minimum, include the following:

1. Written documentation of the success of the cleaning.
 2. Site inspection reports, initialed by supervisor, including notation on areas of inspection, as verified through visual inspection.
 3. System areas found to be damaged.
- E. Photographic Documentation: Comply with requirements in Section 013233 "Photographic Documentation."

3.5 RESTORATION

- A. Restore and repair HVAC air-distribution equipment, ducts, plenums, and components according to NADCA ACR 2006, "Restoration and Repair of Mechanical Systems" Section.
- B. Restore service openings capable of future reopening. Comply with requirements in Section 233113 "Metal Ducts." Include location of service openings in Project closeout report.
- C. Replace fibrous-glass materials that cannot be restored by cleaning or resurfacing. Comply with requirements in Section 233113 "Metal Ducts" and Section 233116 "Nonmetal Ducts."
- D. Replace damaged insulation according to Section 230713 "Duct Insulation."
- E. Ensure that closures do not hinder or alter airflow.
- F. New closure materials, including insulation, shall match opened materials and shall have removable closure panels fitted with gaskets and fasteners.
- G. Reseal fibrous-glass ducts. Comply with requirements in Section 233116 "Nonmetal Ducts."

END OF SECTION 230130.51

SECTION 230513 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.3 COORDINATION

- A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
 - 1. Motor controllers.
 - 2. Torque, speed, and horsepower requirements of the load.
 - 3. Ratings and characteristics of supply circuit and required control sequence.
 - 4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

- A. Comply with NEMA MG 1 unless otherwise indicated.
- B. Comply with IEEE 841 for severe-duty motors.

2.2 MOTOR CHARACTERISTICS

- A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.
- B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

- A. Description: NEMA MG 1, Design B, medium induction motor.
- B. Efficiency: Energy efficient, as defined in NEMA MG 1.
- C. Service Factor: 1.15.
- D. Multispeed Motors: Variable torque.
 - 1. For motors with 2:1 speed ratio, consequent pole, single winding.
 - 2. For motors with other than 2:1 speed ratio, separate winding for each speed.
- E. Multispeed Motors: Separate winding for each speed.
- F. Rotor: Random-wound, squirrel cage.
- G. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
- H. Temperature Rise: Match insulation rating.
- I. Insulation: Class F.
- J. Code Letter Designation:
 - 1. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.
- K. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

- A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
- B. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
 - 1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
 - 2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
 - 3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
 - 4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.
- C. Severe-Duty Motors: Comply with IEEE 841, with 1.15 minimum service factor.

2.5 SINGLE-PHASE MOTORS

- A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
 - 1. Permanent-split capacitor.
 - 2. Split phase.
 - 3. Capacitor start, inductor run.
 - 4. Capacitor start, capacitor run.
- B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
- C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
- D. Motors 1/20 HP and Smaller: Shaded-pole type.
- E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 230513

SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Stack-sleeve fittings.
 - 3. Sleeve-seal systems.
 - 4. Sleeve-seal fittings.
 - 5. Grout.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.
- C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
- D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

2.2 STACK-SLEEVE FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Jay R. Smith Mfg Co; a division of Morris Group International.
 2. Zurn Industries, LLC.
- B. Description: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring, bolts, and nuts for membrane flashing.
1. Underdeck Clamp: Clamping ring with setscrews.

2.3 SLEEVE-SEAL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Products and Systems, Inc.
 2. Airex Manufacturing.
 3. CALPICO, Inc.
 4. GPT; an EnPro Industries Company.
 5. Metraflex Company (The).
 6. Proco Products, Inc.
- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 2. Pressure Plates: Carbon steel.
 3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.4 SLEEVE-SEAL FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Products and Systems, Inc.
 2. CALPICO, Inc.
 3. GPT; an EnPro Industries Company.
 4. Metraflex Company (The).
 5. Proco Products, Inc.

- B. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall. Unit has plastic or rubber waterstop collar with center opening to match piping OD.

2.5 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
 - 1. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 - 1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
 - 2. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
 - 3. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 079200 "Joint Sealants."
- E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.2 STACK-SLEEVE-FITTING INSTALLATION

- A. Install stack-sleeve fittings in new slabs as slabs are constructed.
 - 1. Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 2. Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing. Comply with requirements for flashing specified in Section 076200 "Sheet Metal Flashing and Trim."
 - 3. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
 - 4. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
 - 5. Using grout, seal the space around outside of stack-sleeve fittings.
- B. Fire-Barrier Penetrations: Maintain indicated fire rating of floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.3 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.4 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

3.5 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
 - 1. Exterior Concrete Walls above Grade:
 - a. Piping Smaller Than NPS 6: Sleeve-seal fittings.
 - b. Piping NPS 6 and Larger: Galvanized-steel wall sleeves.
 - 2. Concrete Slabs-on-Grade:

- a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
 - b. Piping NPS 6 and Larger: Galvanized-steel-pipe sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
3. Concrete Slabs above Grade:
- a. Piping Smaller Than NPS 6: PVC-pipe sleeves.
 - b. Piping NPS 6 and Larger: Stack-sleeve fittings.
4. Interior Partitions:
- a. Piping Smaller Than NPS 6: PVC-pipe sleeves.
 - b. Piping NPS 6 and Larger: Galvanized-steel-sheet sleeves.

END OF SECTION 230517

SECTION 230518 - ESCUTCHEONS FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.
 - 2. Floor plates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
- C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.
- D. Split-Plate, Stamped-Steel Type: With chrome-plated finish, concealed hinge, and spring-clip fasteners.

2.2 FLOOR PLATES

- A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
- B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass with polished, chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - g. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - h. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - i. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
 - j. Bare Piping in Equipment Rooms: One-piece, cast-brass type with polished, chrome-plated finish.
 - k. Bare Piping in Equipment Rooms: One-piece, stamped-steel type or split-plate, stamped-steel type with concealed hinge.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. New Piping: One-piece, floor-plate type.

3.2 FIELD QUALITY CONTROL

- A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 230518

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Thermal-hanger shield inserts.
5. Fastener systems.
6. Pipe stands.
7. Equipment supports.

- B. Related Sections:

1. Section 055000 "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
2. Section 230516 "Expansion Fittings and Loops for HVAC Piping" for pipe guides and anchors.
3. Section 233113 "Metal Ducts" and Section 233116 "Nonmetal Ducts" for duct hangers and supports.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
 1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following; include Product Data for components:
 1. Trapeze pipe hangers.
 2. Metal framing systems.
 3. Pipe stands.
 4. Equipment supports.
- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Detail fabrication and assembly of trapeze hangers.
 2. Design Calculations: Calculate requirements for designing trapeze hangers.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.7 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
 4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
 5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

B. Stainless-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.

2.2 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to the following:
 - a. B-line, an Eaton business.
 - b. Flex-Strut Inc.
 - c. G-Strut.
 - d. Haydon Corporation.
 - e. MIRO Industries.
 - f. Thomas & Betts Corporation; A Member of the ABB Group.
 - g. Unistrut; Part of Atkore International.
 - h. Wesanco, Inc.
2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
3. Standard: MFMA-4.
4. Channels: Continuous slotted steel channel with inturned lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
7. Metallic Coating: Hot-dipped galvanized.
8. Paint Coating: Epoxy.
9. Plastic Coating: PVC or Polyurethane or Epoxy.

B. Non-MFMA Manufacturer Metal Framing Systems:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. CADDY; a brand of nVent.
 - c. Carpenter & Paterson, Inc.
 - d. Empire Industries, Inc
 - e. Gripple Inc.
 - f. MIRO Industries.
 - g. PHD Manufacturing, Inc.
 - h. RectorSeal HVAC; a CSW Industrials Company.
 - i. Rooftop Support Systems, a division of Eberl Iron Works, Inc.
2. Description: Shop- or field-fabricated pipe-support assembly made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
3. Standard: Comply with MFMA-4.
4. Channels: Continuous slotted steel channel with inturned lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
7. Coating: Zinc or PVC.

2.4 THERMAL-HANGER SHIELD INSERTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Buckaroos, Inc.
 2. CADDY; a brand of nVent.
 3. Carpenter & Paterson, Inc.
 4. KB Enterprise.
 5. National Pipe Hanger Corporation.
 6. Pipe Shields Inc.
 7. Piping Technology & Products, Inc.
 8. Rilco Manufacturing Co., Inc.
 9. Value Engineered Products, Inc.
- B. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength and vapor barrier.
- C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.5 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: Insert-wedge-type, stainless-steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.6 PIPE STANDS

- A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
- B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
- C. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.
- D. High-Type, Single-Pipe Stand:
 - 1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
 - 2. Base: Stainless steel.
 - 3. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous-thread rods.
 - 4. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless-steel, roller-type pipe support.
- E. High-Type, Multiple-Pipe Stand:
 - 1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
 - 2. Bases: One or more; plastic.
 - 3. Vertical Members: Two or more protective-coated-steel channels.
 - 4. Horizontal Member: Protective-coated-steel channel.
 - 5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.
- F. Curb-Mounted-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.7 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.8 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 - 2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.
- D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- E. Fastener System Installation:
 - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- F. Pipe Stand Installation:
 - 1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
 - 2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. See Section 077200 "Roof Accessories" for curbs.
- G. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

- H. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- I. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- J. Install lateral bracing with pipe hangers and supports to prevent swaying.
- K. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- L. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- M. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- N. Insulated Piping:
 - 1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 - 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - 5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports, metal trapeze pipe hangers, and metal framing systems and attachments for general service applications.
- F. Use stainless-steel pipe hanger and stainless-steel or corrosion-resistant attachments for hostile environment applications.
- G. Use copper-plated pipe hangers and copper or stainless-steel attachments for copper piping and tubing.
- H. Use padded hangers for piping that is subject to scratching.
- I. Use thermal-hanger shield inserts for insulated piping and tubing.
- J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
 - 2. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
 - 3. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.
 - 4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 - 5. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 - 6. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 - 7. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
 - 8. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
- K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 2. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 3. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 4. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- M. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 6. C-Clamps (MSS Type 23): For structural shapes.
 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- N. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- O. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- P. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- Q. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION 230529

SECTION 230548.13 - VIBRATION CONTROLS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Elastomeric isolation pads.
 - 2. Elastomeric hangers.
 - 3. Restrained isolation roof-curb rails.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
 - 2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of vibration isolation device type required.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show coordination of vibration isolation device installation for HVAC piping and equipment with other systems and equipment in the vicinity, including other supports and restraints, if any.
- B. Qualification Data: For testing agency.

PART 2 - PRODUCTS

2.1 ELASTOMERIC ISOLATION PADS

- A. Elastomeric Isolation Pads:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ace Mountings Co., Inc.
 - b. CADDY; a brand of nVent.

- c. California Dynamics Corporation.
 - d. Isolation Technology, Inc.
 - e. Kinetics Noise Control, Inc.
 - f. Korfund.
 - g. Mason Industries, Inc.
 - h. Novia; A Division of C&P.
 - i. Vibration Eliminator Co., Inc.
 - j. Vibration Isolation.
 - k. Vibration Management Corp.
 - l. Vibration Mountings & Controls, Inc.
2. Fabrication: Single or multiple layers of sufficient durometer stiffness for uniform loading over pad area.
 3. Size: Factory or field cut to match requirements of supported equipment.
 4. Pad Material: Oil and water resistant with elastomeric properties.
 5. Surface Pattern: Ribbed or Waffle pattern.
 6. Infused nonwoven cotton or synthetic fibers.
 7. Load-bearing metal plates adhered to pads.
 8. Sandwich-Core Material: Resilient and elastomeric.
 - a. Surface Pattern: Ribbed or Waffle pattern.
 - b. Infused nonwoven cotton or synthetic fibers.

2.2 ELASTOMERIC HANGERS

A. Elastomeric Mount in a Steel Frame with Upper and Lower Steel Hanger Rods:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ace Mountings Co., Inc.
 - b. CADDY; a brand of nVent.
 - c. California Dynamics Corporation.
 - d. Kinetics Noise Control, Inc.
 - e. Mason Industries, Inc.
 - f. Novia; A Division of C&P.
 - g. Vibration Eliminator Co., Inc.
 - h. Vibration Isolation.
 - i. Vibration Management Corp.
 - j. Vibration Mountings & Controls, Inc.
2. Frame: Steel, fabricated with a connection for an upper threaded hanger rod and an opening on the underside to allow for a maximum of 30 degrees of angular lower hanger-rod misalignment without binding or reducing isolation efficiency.
3. Dampening Element: Molded, oil-resistant rubber, neoprene, or other elastomeric material with a projecting bushing for the underside opening preventing steel to steel contact.

2.3 RESTRAINED ISOLATION ROOF-CURB RAILS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CADDY; a brand of nVent.
 - 2. California Dynamics Corporation.
 - 3. Kinetics Noise Control, Inc.
 - 4. Novia; A Division of C&P.
 - 5. Thybar Corporation.
 - 6. Vibration Eliminator Co., Inc.
 - 7. Vibration Management Corp.
 - 8. Vibration Mountings & Controls, Inc.
- B. Description: Factory-assembled, fully enclosed, insulated, air- and watertight curb rail designed to resiliently support equipment.
- C. Upper Frame: Upper frame shall provide continuous and captive support for equipment.
- D. Lower Support Assembly: The lower support assembly shall be formed sheet metal section containing adjustable and removable steel springs that support upper frame. The lower support assembly shall have a means for attaching to building structure and a wood nailer for attaching roof materials and shall be insulated with a minimum of 2 inches of rigid glass-fiber insulation on inside of assembly. Adjustable, restrained-spring isolators shall be mounted on elastomeric vibration isolation pads and shall have access ports, for level adjustment, with removable waterproof covers at all isolator locations. Isolators shall be located so they are accessible for adjustment at any time during the life of the installation without interfering with the integrity of the roof.
- E. Snubber Bushings: All-directional, elastomeric snubber bushings at least 1/4 inch thick.
- F. Water Seal: Galvanized sheet metal with EPDM seals at corners, attached to upper support frame, extending down past wood nailer of lower support assembly, and counterflashed over roof materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 VIBRATION CONTROL DEVICE INSTALLATION

- A. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.

END OF SECTION 230548.13

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment labels.
 - 2. Warning signs and labels.
 - 3. Pipe labels.
 - 4. Duct labels.
 - 5. Stencils.
 - 6. Valve tags.
 - 7. Warning tags.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve numbering scheme.
- E. Valve Schedules: For each piping system to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Plastic Labels for Equipment:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Brimar Industries, Inc.

- c. Carlton Industries, LP.
 - d. Champion America.
 - e. Craftmark Pipe Markers.
 - f. emedco.
 - g. Kolbi Pipe Marker Co.
 - h. LEM Products Inc.
 - i. Marking Services, Inc.
 - j. Seton Identification Products, a Brady Corporation Company.
2. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
 3. Letter Color: White.
 4. Background Color: Black.
 5. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
 6. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 7. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
 8. Fasteners: Stainless-steel self-tapping screws.
 9. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.
- C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number, and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.
 4. Champion America.
 5. Craftmark Pipe Markers.
 6. emedco.
 7. LEM Products Inc.
 8. Marking Services, Inc.
 9. National Marker Company.
 10. Seton Identification Products, a Brady Corporation Company.
 11. Stranco, Inc.

- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- C. Letter Color: White.
- D. Background Color: Red.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- H. Fasteners: Stainless-steel self-tapping screws.
- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- J. Label Content: Include caution and warning information plus emergency notification instructions.

2.3 PIPE LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Actioncraft Products, Inc; a division of Industrial Test Equipment Co., Inc.
 - 2. Brady Corporation.
 - 3. Brimar Industries, Inc.
 - 4. Carlton Industries, LP.
 - 5. Champion America.
 - 6. Craftmark Pipe Markers.
 - 7. emedco.
 - 8. Kolbi Pipe Marker Co.
 - 9. LEM Products Inc.
 - 10. Marking Services, Inc.
 - 11. Seton Identification Products, a Brady Corporation Company.
- B. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction according to ASME A13.1.
- C. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.
- D. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- E. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
2. Lettering Size: Size letters according to ASME A13.1 for piping.

2.4 DUCT LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Brady Corporation.
 2. Brimar Industries, Inc.
 3. Carlton Industries, LP.
 4. Champion America.
 5. Craftmark Pipe Markers.
 6. emedco.
 7. Kolbi Pipe Marker Co.
 8. LEM Products Inc.
 9. Marking Services, Inc.
 10. Seton Identification Products, a Brady Corporation Company.
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- C. Letter Color: White.
- D. Background Color: Black.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- H. Fasteners: Stainless-steel self-tapping screws.
- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- J. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings; also include duct size and an arrow indicating flow direction.
 1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions or as separate unit on each duct label to indicate flow direction.

2.5 STENCILS

- A. Stencils for Piping:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brimar Industries, Inc.
 - b. Carlton Industries, LP.
 - c. Champion America.
 - d. Craftmark Pipe Markers.
 - e. Kolbi Pipe Marker Co.
 - f. Marking Services, Inc.
2. Lettering Size: Size letters according to ASME A13.1 for piping.
3. Stencil Material: Fiberboard or metal.
4. Stencil Paint: Exterior, gloss, acrylic enamel in colors complying with recommendations in ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.
5. Identification Paint: Exterior, acrylic enamel in colors according to ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.

2.6 VALVE TAGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Actioncraft Products, Inc; a division of Industrial Test Equipment Co., Inc.
 2. Brady Corporation.
 3. Brimar Industries, Inc.
 4. Carlton Industries, LP.
 5. Champion America.
 6. Craftmark Pipe Markers.
 7. emedco.
 8. Kolbi Pipe Marker Co.
 9. LEM Products Inc.
 10. Marking Services, Inc.
 11. Seton Identification Products, a Brady Corporation Company.
- B. Description: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
 1. Tag Material: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 2. Fasteners: Brass wire-link chain or beaded chain or S-hook.
- C. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
 1. Valve-tag schedule shall be included in operation and maintenance data.

2.7 WARNING TAGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Brady Corporation.
 - 2. Brimar Industries, Inc.
 - 3. Carlton Industries, LP.
 - 4. Champion America.
 - 5. Craftmark Pipe Markers.
 - 6. emedco.
 - 7. Kolbi Pipe Marker Co.
 - 8. LEM Products Inc.
 - 9. Marking Services, Inc.
 - 10. Seton Identification Products, a Brady Corporation Company.
- A. Description: Preprinted or partially preprinted accident-prevention tags of plasticized card stock with matte finish suitable for writing.
 - 1. Size: Approximately 4 by 7 inches.
 - 2. Fasteners: Brass grommet and wire.
 - 3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
 - 4. Color: Safety-yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.
- D. Coordinate locations of devices and equipment above ceilings and provide engraved label on ceiling at location of equipment or device.

3.3 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.

- B. Locate equipment labels where accessible and visible.

3.4 PIPE LABEL INSTALLATION

- A. Piping Color Coding: Painting of piping is specified in Section 099123 "Interior Painting." Section 099600 "High-Performance Coatings."
- B. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, with painted, color-coded bands or rectangles on each piping system.
 - 1. Identification Paint: Use for contrasting background.
 - 2. Stencil Paint: Use for pipe marking.
- C. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - 1. Near each valve and control device.
 - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 - 3. Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.
 - 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- D. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.
- E. Pipe Label Color Schedule:
 - 1. Refrigerant Piping: Black letters on a safety-white background.

3.5 DUCT LABEL INSTALLATION

- A. Install self-adhesive duct labels with permanent adhesive on air ducts in the following color codes:
 - 1. Blue: For cold-air supply ducts.
 - 2. Yellow: For hot-air supply ducts.
 - 3. Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
- B. Locate labels near points where ducts enter into and exit from concealed spaces and at maximum intervals of 50 feet in each space where ducts are exposed or concealed by removable ceiling system.

3.6 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
 - 1. Valve-Tag Size and Shape:
 - a. Refrigerant: 1-1/2 inches, round.
 - 2. Valve-Tag Colors:
 - a. Toxic and Corrosive Fluids: Black letters on a safety-orange background.
 - b. Flammable Fluids: Black letters on a safety-yellow background.
 - c. Combustible Fluids: White letters on a safety-brown background.
 - d. Potable and Other Water: White letters on a safety-green background.
 - e. Compressed Air: White letters on a safety-blue background.
 - f. Defined by User: White letters on a safety-purple background, black letters on a safety-white background, white letters on a safety-gray background, and white letters on a safety-black background

3.7 WARNING-TAG INSTALLATION

- A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 230553

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Balancing Air Systems:
 - a. Constant-volume air systems.
 - 2. Testing, Adjusting, and Balancing Equipment:
 - a. Motors.
 - b. Condensing units.
 - 3. Testing, adjusting, and balancing existing systems and equipment.
 - 4. Duct leakage tests.
 - 5. Control system verification.

1.3 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. BAS: Building automation systems.
- C. NEBB: National Environmental Balancing Bureau.
- D. TAB: Testing, adjusting, and balancing.
- E. TABB: Testing, Adjusting, and Balancing Bureau.
- F. TAB Specialist: An independent entity meeting qualifications to perform TAB work.
- G. TDH: Total dynamic head.

1.4 PREINSTALLATION MEETINGS

- A. TAB Conference: If requested by the Owner, conduct a TAB conference at Project site after approval of the TAB strategies and procedures plan to develop a mutual understanding of the details. Provide a minimum of 14 days' advance notice of scheduled meeting time and location.

1. Minimum Agenda Items:

- a. The Contract Documents examination report.
- b. The TAB plan.
- c. Needs for coordination and cooperation of trades and subcontractors.
- d. Proposed procedures for documentation and communication flow.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Within 30 days of Contractor's Notice to Proceed, submit documentation that the TAB specialist and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.
- B. Contract Documents Examination Report: Within 30 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.
- C. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.
- D. System Readiness Checklists: Within 30 days of Contractor's Notice to Proceed, submit system readiness checklists as specified in "Preparation" Article.
- E. Examination Report: Submit a summary report of the examination review required in "Examination" Article.
- F. Certified TAB reports.
- G. Sample report forms.
- H. Instrument calibration reports, to include the following:
 1. Instrument type and make.
 2. Serial number.
 3. Application.
 4. Dates of use.
 5. Dates of calibration.

1.6 QUALITY ASSURANCE

- A. TAB Specialists Qualifications: Certified by AABC or NEBB.
 1. TAB Field Supervisor: Employee of the TAB specialist and certified by AABC or NEBB.
 2. TAB Technician: Employee of the TAB specialist and certified by AABC or NEBB as a TAB technician.
- B. Instrumentation Type, Quantity, Accuracy, and Calibration: Comply with requirements in ASHRAE 111, Section 4, "Instrumentation."
- C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing."

- D. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.7.2.3 - "System Balancing."

1.7 FIELD CONDITIONS

- A. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems designs that may preclude proper TAB of systems and equipment.
- B. Examine installed systems for balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are applicable for intended purpose and are accessible.
- C. Examine the approved submittals for HVAC systems and equipment.
- D. Examine equipment performance data including fan and pump curves.
 - 1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
 - 2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.
- E. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
- F. Examine test reports specified in individual system and equipment Sections.
- G. Examine HVAC equipment and verify that bearings are greased, belts are aligned and tight, filters are clean, and equipment with functioning controls is ready for operation.
- H. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.
- I. Examine operating safety interlocks and controls on HVAC equipment.

- J. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

- A. Prepare a TAB plan that includes the following:
 - 1. Equipment and systems to be tested.
 - 2. Strategies and step-by-step procedures for balancing the systems.
 - 3. Instrumentation to be used.
 - 4. Sample forms with specific identification for all equipment.
- B. Perform system-readiness checks of HVAC systems and equipment to verify system readiness for TAB work. Include, at a minimum, the following:
 - 1. Airside:
 - a. Verify that leakage and pressure tests on air distribution systems have been satisfactorily completed.
 - b. Duct systems are complete with terminals installed.
 - c. Volume, smoke, and fire dampers are open and functional.
 - d. Clean filters are installed.
 - e. Fans are operating, free of vibration, and rotating in correct direction.
 - f. Variable-frequency controllers' startup is complete and safeties are verified.
 - g. Automatic temperature-control systems are operational.
 - h. Ceilings are installed.
 - i. Windows and doors are installed.
 - j. Suitable access to balancing devices and equipment is provided.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" and ASHRAE 111 and in this Section.
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
 - 1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
 - 2. After testing and balancing, install test ports and duct access doors that comply with requirements in Section 233300 "Air Duct Accessories."
 - 3. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 230713 "Duct Insulation," Section 230716 "HVAC Equipment Insulation," and Section 230719 "HVAC Piping Insulation."

- C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Cross-check the summation of required outlet volumes with required fan volumes.
- B. Prepare schematic diagrams of systems' "as-built" duct layouts.
- C. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- D. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.
- E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- F. Verify that motor starters are equipped with properly sized thermal protection.
- G. Check dampers for proper position to achieve desired airflow path.
- H. Check for airflow blockages.
- I. Check condensate drains for proper connections and functioning.
- J. Check for proper sealing of air-handling-unit components.
- K. Verify that air duct system is sealed as specified in Section 233113 "Metal Ducts."

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

- A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
 - 1. Measure total airflow.
 - a. Set outside-air, return-air, and relief-air dampers for proper position that simulates minimum outdoor-air conditions.
 - b. Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
 - c. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
 - d. If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.
 - 2. Measure fan static pressures as follows:

- a. Measure static pressure directly at the fan outlet or through the flexible connection.
 - b. Measure static pressure directly at the fan inlet or through the flexible connection.
 - c. Measure static pressure across each component that makes up the air-handling system.
 - d. Report artificial loading of filters at the time static pressures are measured.
 3. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
 4. Obtain approval from Construction Manager for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in HVAC Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
 5. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload occurs. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
- B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows.
1. Measure airflow of submain and branch ducts.
 2. Adjust submain and branch duct volume dampers for specified airflow.
 3. Re-measure each submain and branch duct after all have been adjusted.
- C. Adjust air inlets and outlets for each space to indicated airflows.
1. Set airflow patterns of adjustable outlets for proper distribution without drafts.
 2. Measure inlets and outlets airflow.
 3. Adjust each inlet and outlet for specified airflow.
 4. Re-measure each inlet and outlet after they have been adjusted.
- D. Verify final system conditions.
1. Re-measure and confirm that minimum outdoor, return, and relief airflows are within design. Readjust to design if necessary.
 2. Re-measure and confirm that total airflow is within design.
 3. Re-measure all final fan operating data, rpms, volts, amps, and static profile.
 4. Mark all final settings.
 5. Test system in economizer mode. Verify proper operation and adjust if necessary.
 6. Measure and record all operating data.
 7. Record final fan-performance data.

3.6 PROCEDURES FOR MOTORS

- A. Motors 1/2 HP and Larger: Test at final balanced conditions and record the following data:
1. Manufacturer's name, model number, and serial number.
 2. Motor horsepower rating.

3. Motor rpm.
4. Phase and hertz.
5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter size and thermal-protection-element rating.
8. Service factor and frame size.

- B. Motors Driven by Variable-Frequency Controllers: Test manual bypass of controller to prove proper operation.

3.7 PROCEDURES FOR CONDENSING UNITS

- A. Verify proper rotation of fans.
- B. Measure entering- and leaving-air temperatures.
- C. Record fan and motor operating data.

3.8 DUCT LEAKAGE TESTS

- A. Witness the duct pressure testing performed by Installer.
- B. Verify that proper test methods are used and that leakage rates are within specified tolerances.
- C. Report deficiencies observed.

3.9 CONTROLS VERIFICATION

- A. In conjunction with system balancing, perform the following:
 1. Verify temperature control system is operating within the design limitations.
 2. Confirm that the sequences of operation are in compliance with Contract Documents.
 3. Verify that controllers are calibrated and function as intended.
 4. Verify that controller set points are as indicated.
 5. Verify the operation of lockout or interlock systems.
 6. Verify the operation of valve and damper actuators.
 7. Verify that controlled devices are properly installed and connected to correct controller.
 8. Verify that controlled devices travel freely and are in position indicated by controller: open, closed, or modulating.
 9. Verify location and installation of sensors to ensure that they sense only intended temperature, humidity, or pressure.
- B. Reporting: Include a summary of verifications performed, remaining deficiencies, and variations from indicated conditions.

3.10 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

- A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.

1. Measure and record the operating speed, airflow, and static pressure of each fan.
 2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
 3. Check the refrigerant charge.
 4. Check the condition of filters.
 5. Check the condition of coils.
 6. Check the operation of the drain pan and condensate-drain trap.
 7. Check bearings and other lubricated parts for proper lubrication.
 8. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.
- B. Before performing testing and balancing of existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished. Verify the following:
1. New filters are installed.
 2. Coils are clean and fins combed.
 3. Drain pans are clean.
 4. Fans are clean.
 5. Bearings and other parts are properly lubricated.
 6. Deficiencies noted in the preconstruction report are corrected.
- C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.
1. Compare the indicated airflow of the renovated work to the measured fan airflows, and determine the new fan speed and the face velocity of filters and coils.
 2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
 3. If calculations increase or decrease the airflow rates and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.
 4. Balance each air outlet.

3.11 TOLERANCES

- A. Set HVAC system's airflow rates and water flow rates within the following tolerances:
1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent
 2. Air Outlets and Inlets: Plus or minus 10 percent.
- B. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.

3.12 PROGRESS REPORTING

- A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems balancing

devices. Recommend changes and additions to systems balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

- B. Status Reports: Prepare weekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.13 FINAL REPORT

- A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
 - 1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
 - 2. Include a list of instruments used for procedures, along with proof of calibration.
 - 3. Certify validity and accuracy of field data.
- B. Final Report Contents: In addition to certified field-report data, include the following:
 - 1. Fan curves.
 - 2. Manufacturers' test data.
 - 3. Field test reports prepared by system and equipment installers.
 - 4. Other information relative to equipment performance; do not include Shop Drawings and Product Data.
- C. General Report Data: In addition to form titles and entries, include the following data:
 - 1. Title page.
 - 2. Name and address of the TAB specialist.
 - 3. Project name.
 - 4. Project location.
 - 5. Architect's name and address.
 - 6. Engineer's name and address.
 - 7. Contractor's name and address.
 - 8. Report date.
 - 9. Signature of TAB supervisor who certifies the report.
 - 10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
 - 11. Summary of contents including the following:
 - a. Indicated versus final performance.
 - b. Notable characteristics of systems.
 - c. Description of system operation sequence if it varies from the Contract Documents.
 - 12. Nomenclature sheets for each item of equipment.
 - 13. Data for terminal units, including manufacturer's name, type, size, and fittings.
 - 14. Notes to explain why certain final data in the body of reports vary from indicated values.
 - 15. Test conditions for fans and pump performance forms including the following:

- a. Settings for outdoor-, return-, and exhaust-air dampers.
 - b. Conditions of filters.
 - c. Cooling coil, wet- and dry-bulb conditions.
 - d. Face and bypass damper settings at coils.
 - e. Fan drive settings including settings and percentage of maximum pitch diameter.
 - f. Inlet vane settings for variable-air-volume systems.
 - g. Settings for supply-air, static-pressure controller.
 - h. Other system operating conditions that affect performance.
- D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
- 1. Quantities of outdoor, supply, return, and exhaust airflows.
 - 2. Duct, outlet, and inlet sizes.
 - 3. Balancing stations.
 - 4. Position of balancing devices.
- E. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:
- 1. Unit Data:
 - a. Unit identification.
 - b. Location.
 - c. Make and type.
 - d. Model number and unit size.
 - e. Manufacturer's serial number.
 - f. Unit arrangement and class.
 - g. Discharge arrangement.
 - h. Sheave make, size in inches, and bore.
 - i. Center-to-center dimensions of sheave and amount of adjustments in inches.
 - j. Number, make, and size of belts.
 - k. Number, type, and size of filters.
 - 2. Motor Data:
 - a. Motor make, and frame type and size.
 - b. Horsepower and rpm.
 - c. Volts, phase, and hertz.
 - d. Full-load amperage and service factor.
 - e. Sheave make, size in inches, and bore.
 - f. Center-to-center dimensions of sheave and amount of adjustments in inches.
 - 3. Test Data (Indicated and Actual Values):
 - a. Total airflow rate in cfm.
 - b. Total system static pressure in inches wg.
 - c. Fan rpm.
 - d. Discharge static pressure in inches wg.
 - e. Filter static-pressure differential in inches wg.
 - f. Preheat-coil static-pressure differential in inches wg.
 - g. Cooling-coil static-pressure differential in inches wg.

- h. Heating-coil static-pressure differential in inches wg.
- i. Outdoor airflow in cfm.
- j. Return airflow in cfm.
- k. Outdoor-air damper position.
- l. Return-air damper position.

F. Apparatus-Coil Test Reports:

1. Coil Data:

- a. System identification.
- b. Location.
- c. Coil type.
- d. Number of rows.
- e. Fin spacing in fins per inch o.c.
- f. Make and model number.
- g. Face area in sq. ft..
- h. Tube size in NPS.
- i. Tube and fin materials.
- j. Circuiting arrangement.

2. Test Data (Indicated and Actual Values):

- a. Airflow rate in cfm.
- b. Average face velocity in fpm.
- c. Air pressure drop in inches wg.
- d. Outdoor-air, wet- and dry-bulb temperatures in deg F.
- e. Return-air, wet- and dry-bulb temperatures in deg F.
- f. Entering-air, wet- and dry-bulb temperatures in deg F.
- g. Leaving-air, wet- and dry-bulb temperatures in deg F.
- h. Refrigerant expansion valve and refrigerant types.
- i. Refrigerant suction pressure in psig.
- j. Refrigerant suction temperature in deg F.

G. Electric-Coil Test Reports: For electric furnaces, duct coils, and electric coils installed in central-station air-handling units, include the following:

1. Unit Data:

- a. System identification.
- b. Location.
- c. Coil identification.
- d. Capacity in Btu/h.
- e. Number of stages.
- f. Connected volts, phase, and hertz.
- g. Rated amperage.
- h. Airflow rate in cfm.
- i. Face area in sq. ft.
- j. Minimum face velocity in fpm.

2. Test Data (Indicated and Actual Values):

- a. Heat output in Btu/h.
 - b. Airflow rate in cfm.
 - c. Air velocity in fpm.
 - d. Entering-air temperature in deg F.
 - e. Leaving-air temperature in deg F.
 - f. Voltage at each connection.
 - g. Amperage for each phase.
- H. Fan Test Reports: For supply, return, and exhaust fans, include the following:
 - 1. Fan Data:
 - a. System identification.
 - b. Location.
 - c. Make and type.
 - d. Model number and size.
 - e. Manufacturer's serial number.
 - f. Arrangement and class.
 - g. Sheave make, size in inches, and bore.
 - h. Center-to-center dimensions of sheave and amount of adjustments in inches.
 - 2. Motor Data:
 - a. Motor make, and frame type and size.
 - b. Horsepower and rpm.
 - c. Volts, phase, and hertz.
 - d. Full-load amperage and service factor.
 - e. Sheave make, size in inches, and bore.
 - f. Center-to-center dimensions of sheave, and amount of adjustments in inches.
 - g. Number, make, and size of belts.
 - 3. Test Data (Indicated and Actual Values):
 - a. Total airflow rate in cfm.
 - b. Total system static pressure in inches wg.
 - c. Fan rpm.
 - d. Discharge static pressure in inches wg.
 - e. Suction static pressure in inches wg.
- I. Round and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:
 - 1. Report Data:
 - a. System and air-handling-unit number.
 - b. Location and zone.
 - c. Traverse air temperature in deg F.
 - d. Duct static pressure in inches wg.
 - e. Duct size in inches.
 - f. Duct area in sq. ft.
 - g. Indicated airflow rate in cfm.

- h. Indicated velocity in fpm.
- i. Actual airflow rate in cfm.
- j. Actual average velocity in fpm.
- k. Barometric pressure in psig.

J. Air-Terminal-Device Reports:

1. Unit Data:

- a. System and air-handling unit identification.
- b. Location and zone.
- c. Apparatus used for test.
- d. Area served.
- e. Make.
- f. Number from system diagram.
- g. Type and model number.
- h. Size.
- i. Effective area in sq. ft.

2. Test Data (Indicated and Actual Values):

- a. Airflow rate in cfm.
- b. Air velocity in fpm.
- c. Preliminary airflow rate as needed in cfm.
- d. Preliminary velocity as needed in fpm.
- e. Final airflow rate in cfm.
- f. Final velocity in fpm.
- g. Space temperature in deg F.

K. System-Coil Reports: For reheat coils include the following:

1. Unit Data:

- a. System and air-handling-unit identification.
- b. Location and zone.
- c. Room or riser served.
- d. Coil make and size.
- e. Flowmeter type.

2. Test Data (Indicated and Actual Values):

- a. Airflow rate in cfm.
- b. Entering-air temperature in deg F.
- c. Leaving-air temperature in deg F.

L. Instrument Calibration Reports:

1. Report Data:

- a. Instrument type and make.
- b. Serial number.

- c. Application.
- d. Dates of use.
- e. Dates of calibration.

3.14 VERIFICATION OF TAB REPORT

- A. The TAB specialist's test and balance engineer shall conduct the inspection in the presence of Construction Manager.
- B. Construction Manager shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.
- C. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
- D. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.
- E. If TAB work fails, proceed as follows:
 - 1. TAB specialists shall recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
 - 2. If the second final inspection also fails, Owner may contract the services of another TAB specialist to complete TAB work according to the Contract Documents and deduct the cost of the services from the original TAB specialist's final payment.
 - 3. If the second verification also fails, Owner may contact AABC Headquarters regarding the AABC National Performance Guaranty.
- F. Prepare test and inspection reports.

3.15 ADDITIONAL TESTS

- A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 230593

SECTION 230713 - DUCT INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes insulating the following duct services:
 - 1. Indoor, concealed supply and outdoor air.
 - 2. Indoor, concealed return located in unconditioned space.
 - 3. Indoor, concealed exhaust between isolation damper and penetration of building exterior.
- B. Related Sections:
 - 1. Section 233113 "Metal Ducts" for duct liners.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
 - 2. Detail insulation application at elbows, fittings, dampers, specialties and flanges for each type of insulation.
 - 3. Detail application of field-applied jackets.
 - 4. Detail application at linkages of control devices.
- C. Samples: For each type of insulation and jacket indicated. Identify each Sample, describing product and intended use. Sample sizes are as follows:
 - 1. Sheet Form Insulation Materials: 12 inches square.
 - 2. Sheet Jacket Materials: 12 inches square.
 - 3. Manufacturer's Color Charts: For products where color is specified, show the full range of colors available for each type of finish material.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.

- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Coordinate clearance requirements with duct Installer for duct insulation application. Before preparing ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

1.8 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Duct Insulation Schedule, General," "Indoor Duct and Plenum Insulation Schedule," and "Aboveground, Outdoor Duct and Plenum Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type II for sheet materials.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. K-Flex USA.
- G. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTEED Corporation.
 - b. Johns Manville; a Berkshire Hathaway Company.
 - c. Knauf Insulation.
 - d. Manson Insulation, Inc.
 - e. Owens Corning.
- H. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. CertainTEED Corporation.
- b. Johns Manville; a Berkshire Hathaway Company.
- c. Knauf Insulation.
- d. Manson Insulation, Inc.
- e. Owens Corning.

2.2 FIRE-RATED INSULATION SYSTEMS

- A. Fire-Rated Blanket: High-temperature, flexible, blanket insulation with FSK jacket that is tested and certified to provide a 2-hour fire rating by an NRTL acceptable to authorities having jurisdiction.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M.
 - b. CertainTEED Corporation.
 - c. Johns Manville; a Berkshire Hathaway Company.
 - d. Nelson Firestop; a brand of Emerson Industrial Automation.
 - e. Thermal Ceramics.
 - f. Unifrax Corporation.

2.3 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. K-Flex USA.
 - 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.

- b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. Mon-Eco Industries, Inc.
- 2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. Mon-Eco Industries, Inc.
 - 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
- 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below ambient services.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Knauf Insulation.
 - d. Vimasco Corporation.
 - 2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 - 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 - 4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 - 5. Color: White.

C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. Mon-Eco Industries, Inc.
2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
3. Service Temperature Range: 0 to 180 deg F.
4. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
5. Color: White.

D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 30-mil dry film thickness.
3. Service Temperature Range: Minus 50 to plus 220 deg F.
4. Solids Content: ASTM D 1644, 33 percent by volume and 46 percent by weight.
5. Color: White.

2.5 LAGGING ADHESIVES

A. Description: Comply with MIL-A-3316C, Class I, Grade A and shall be compatible with insulation materials, jackets, and substrates.

1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Vimasco Corporation.
3. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over duct insulation.
4. Service Temperature Range: 0 to plus 180 deg F.
5. Color: White.

2.6 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. Mon-Eco Industries, Inc.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.7 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.
4. FSP Jacket: Aluminum-foil, fiberglass-reinforced scrim with polyethylene backing; complying with ASTM C 1136, Type II.
5. Vinyl Jacket: White vinyl with a permeance of 1.3 perms when tested according to ASTM E 96/E 96M, Procedure A, and complying with NFPA 90A and NFPA 90B.

2.8 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Glass-Fiber Fabric: Approximately 6 oz./sq. yd. with a thread count of 5 strands by 5 strands/sq. in. for covering ducts.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.

2.9 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. FSK Jacket: Aluminum-foil-face, fiberglass-reinforced scrim with kraft-paper backing.
- C. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Johns Manville; a Berkshire Hathaway Company.
 - b. P.I.C. Plastics, Inc.
 - c. Proto Corporation.
 - d. Speedline Corporation.
 - 2. Adhesive: As recommended by jacket material manufacturer.
 - 3. Color: White.
- D. Metal Jacket:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. RPR Products, Inc.
 - 2. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
 - a. Factory cut and rolled to size.
 - b. Finish and thickness are indicated in field-applied jacket schedules.
 - c. Moisture Barrier for Indoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.
 - d. Moisture Barrier for Outdoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.
- E. Self-Adhesive Outdoor Jacket: 60-mil-thick, laminated vapor barrier and waterproofing membrane for installation over insulation located aboveground outdoors; consisting of a rubberized bituminous resin on a crosslaminated polyethylene film covered with white aluminum-foil facing.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Polyguard Products, Inc.

2.10 TAPES

- A. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Avery Dennison Corporation, Specialty Tapes Division.
 - b. Compac Corporation.

- c. Ideal Tape Co., Inc., an American Biltrite Company.
- d. Knauf Insulation.
- e. Venture Tape.
- 2. Width: 3 inches.
- 3. Thickness: 6.5 mils.
- 4. Adhesion: 90 ounces force/inch in width.
- 5. Elongation: 2 percent.
- 6. Tensile Strength: 40 lbf/inch in width.
- 7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

2.11 SECUREMENTS

A. Bands:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. RPR Products, Inc.
- 2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304; 0.015 inch thick, 1/2 inch wide with closed seal.
- 3. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with closed seal.
- 4. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

B. Insulation Pins and Hangers:

- 1. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AGM Industries, Inc.
 - 2. Gemco.
 - 3. Midwest Fasteners, Inc.
 - b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - c. Spindle: Copper- or zinc-coated, low-carbon steel, fully annealed, 0.106-inch-diameter shank, length to suit depth of insulation indicated.
 - d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
- 2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick, galvanized-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AGM Industries, Inc.
 2. Gemco.
 3. Hardcast; a Carlisle Company.
 4. Midwest Fasteners, Inc.
 5. Nelson Stud Welding.
- b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.
3. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Gemco.
 2. Midwest Fasteners, Inc.
- C. Staples: Outward-clinching insulation staples, nominal 3/4-inch-wide, stainless steel or Monel.
- D. Wire: 0.080-inch nickel-copper alloy.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. C& F Wire.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
1. Verify that systems to be insulated have been tested and are free of defects.
 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.

- B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Keep insulation materials dry during application and finishing.
- G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- H. Install insulation with least number of joints practical.
- I. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
 - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
- J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- K. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
 - a. For below ambient services, apply vapor-barrier mastic over staples.
 - 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.
- L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 - 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 - 4. Seal jacket to wall flashing with flashing sealant.
- C. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- D. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.
 - 1. Comply with requirements in Section 078413 "Penetration Firestopping" and fire-resistive joint sealers.
- E. Insulation Installation at Floor Penetrations:
 - 1. Duct: For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
 - 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.6 INSTALLATION OF MINERAL-FIBER INSULATION

- A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
 - 1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
 - 2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
 - 3. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
 - a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
 - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
 - 4. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
 - 5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
 - 6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.
- B. Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
 - 1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
 - 2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
 - 3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

- a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
 - b. On duct sides with dimensions larger than 18 inches, space pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
 - c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
 - d. Do not overcompress insulation during installation.
 - e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
 - a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
 - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
 5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
 6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.7 FIELD-APPLIED JACKET INSTALLATION

- A. Where glass-cloth jackets are indicated, install directly over bare insulation or insulation with factory-applied jackets.
 1. Draw jacket smooth and tight to surface with 2-inch overlap at seams and joints.
 2. Embed glass cloth between two 0.062-inch-thick coats of lagging adhesive.
 3. Completely encapsulate insulation with coating, leaving no exposed insulation.
- B. Where FSK jackets are indicated, install as follows:
 1. Draw jacket material smooth and tight.
 2. Install lap or joint strips with same material as jacket.
 3. Secure jacket to insulation with manufacturer's recommended adhesive.

4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch-wide joint strips at end joints.
 5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.
- C. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.8 FIRE-RATED INSULATION SYSTEM INSTALLATION

- A. Where fire-rated insulation system is indicated, secure system to ducts and duct hangers and supports to maintain a continuous fire rating.
- B. Insulate duct access panels and doors to achieve same fire rating as duct.
- C. Install firestopping at penetrations through fire-rated assemblies. Fire-stop systems are specified in Section 078413 "Penetration Firestopping."

3.9 FINISHES

- A. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.
- B. Do not field paint aluminum or stainless-steel jackets.

3.10 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.
- B. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.11 DUCT INSULATION SCHEDULE, GENERAL

- A. Plenums and Ducts Requiring Insulation:
 1. Indoor, concealed supply and outdoor air.
 2. Indoor, concealed return located in unconditioned space.
 3. Indoor, concealed exhaust between isolation damper and penetration of building exterior.
- B. Items Not Insulated:

1. Fibrous-glass ducts.
2. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
3. Factory-insulated flexible ducts.
4. Factory-insulated plenums and casings.
5. Flexible connectors.
6. Vibration-control devices.
7. Factory-insulated access panels and doors.

3.12 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

- A. Concealed, round, supply-air duct insulation shall be one of the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.
 2. Mineral-Fiber Board: 1-1/2 inches thick and 3-lb/cu. ft. nominal density.
- B. Concealed, round, return-air duct insulation shall be one of the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.
 2. Mineral-Fiber Board: 1-1/2 inches thick and 3-lb/cu. ft. nominal density.
- C. Concealed, rectangular, supply-air duct insulation shall be one of the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.
 2. Mineral-Fiber Board: 1-1/2 inches thick and 3-lb/cu. ft. nominal density.
- D. Concealed, rectangular, return-air duct insulation shall be one of the following:
 1. Mineral-Fiber Blanket: 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.
 2. Mineral-Fiber Board: 1-1/2 inches thick and 3-lb/cu. ft. nominal density.
- E. Concealed, rectangular, outdoor-air duct insulation shall be one of the following:
 1. Flexible Elastomeric: 1 inch thick.
 2. Polyolefin: 1 inch thick.

3.13 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.

END OF SECTION 230713

SECTION 230719 - HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes insulating the following HVAC piping systems:
 - 1. Condensate drain piping, indoors.
 - 2. Refrigerant suction and hot-gas piping, indoors and outdoors.
- B. Related Sections:
 - 1. Section 230713 "Duct Insulation."

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
 - 2. Detail insulation application at pipe expansion joints for each type of insulation.
 - 3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
 - 4. Detail removable insulation at piping specialties.
 - 5. Detail application of field-applied jackets.
 - 6. Detail application at linkages of control devices.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

1.8 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Armacell LLC.
 - b. Armstrong.
 - c. K-Flex USA.
 - d. Owens Corning.

2.2 INSULATING CEMENTS

- A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Ramco Insulation, Inc.

2.3 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. K-Flex USA.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Knauf Insulation.
 - d. Vimasco Corporation.
 2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 5. Color: White.
- C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below-ambient services.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
 2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
 3. Service Temperature Range: 0 to 180 deg F.
 4. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
 5. Color: White.

D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below-ambient services.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Foster Brand; H.B. Fuller Construction Products.
2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 30-mil dry film thickness.
3. Service Temperature Range: Minus 50 to plus 220 deg F.
4. Solids Content: ASTM D 1644, 33 percent by volume and 46 percent by weight.
5. Color: White.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 1. Verify that systems to be insulated have been tested and are free of defects.
 2. Verify that surfaces to be insulated are clean and dry.
 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.
- C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
 - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
 - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- O. For above-ambient services, do not install insulation to the following:
 - 1. Vibration-control devices.
 - 2. Testing agency labels and stamps.
 - 3. Nameplates and data plates.

3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install

- insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 4. Seal jacket to wall flashing with flashing sealant.
- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.
- F. Insulation Installation at Floor Penetrations:
1. Pipe: Install insulation continuously through floor penetrations.
 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."
- 3.5 GENERAL PIPE INSULATION INSTALLATION
- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.

3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
 5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
 6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
 7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
 8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
 9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.
- D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
 2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
 3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
 4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches (50 mm) over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe

insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.

5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- B. Insulation Installation on Pipe Flanges:
 1. Install pipe insulation to outer diameter of pipe flange.
 2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
 3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
 4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- C. Insulation Installation on Pipe Fittings and Elbows:
 1. Install mitered sections of pipe insulation.
 2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- D. Insulation Installation on Valves and Pipe Specialties:
 1. Install preformed valve covers manufactured of same material as pipe insulation when available.
 2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 3. Install insulation to flanges as specified for flange insulation application.
 4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.7 FINISHES

- A. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.
- B. Do not field paint aluminum or stainless-steel jackets.

3.8 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - 1. Drainage piping located in crawl spaces.
 - 2. Underground piping.
 - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.9 INDOOR PIPING INSULATION SCHEDULE

- A. Condensate and Equipment Drain Water below 60 Deg F:
 - 1. All Pipe Sizes: Insulation shall be the following:
 - a. Flexible Elastomeric: 3/4 inch thick.
- B. Refrigerant Suction and Hot-Gas Piping:
 - 1. All Pipe Sizes: Insulation shall be the following:
 - a. Flexible Elastomeric: 1 inch thick.
- C. Refrigerant Suction and Hot-Gas Flexible Tubing:
 - 1. All Pipe Sizes: Insulation shall be the following:
 - a. Flexible Elastomeric: 1 inch thick.

3.10 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

- A. Refrigerant Suction and Hot-Gas Piping:
 - 1. All Pipe Sizes: Insulation shall be the following:
 - a. Flexible Elastomeric: 2 inches thick.
- B. Refrigerant Suction and Hot-Gas Flexible Tubing:
 - 1. All Pipe Sizes: Insulation shall be the following:
 - a. Flexible Elastomeric: 2 inches thick.

END OF SECTION 230719

SECTION 232300 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Refrigerant pipes and fittings.
 - 2. Refrigerant piping valves and specialties.
 - 3. Refrigerants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of valve and refrigerant piping specialty.
 - 1. Include pressure drop, based on manufacturer's test data, for the following:
 - a. Thermostatic expansion valves.
 - b. Solenoid valves.
 - c. Hot-gas bypass valves.
 - d. Filter dryers.
 - e. Strainers.
 - f. Pressure-regulating valves.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."
- B. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.6 PRODUCT STORAGE AND HANDLING

- A. Store piping with end caps in place to ensure that piping interior and exterior are clean when installed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Line Test Pressure for Refrigerant R-410A:
 - 1. Suction Lines for Air-Conditioning Applications: 300 psig.
 - 2. Suction Lines for Heat-Pump Applications: 535 psig.
 - 3. Hot-Gas and Liquid Lines: 535 psig.

2.2 COPPER TUBE AND FITTINGS

- A. Copper Tube: ASTM B 280, Type ACR.
- B. Wrought-Copper Fittings: ASME B16.22.
- C. Wrought-Copper Unions: ASME B16.22.
- D. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.
- E. Brazing Filler Metals: AWS A5.8/A5.8M.
- F. Flexible Connectors:
 - 1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
 - 2. End Connections: Socket ends.
 - 3. Offset Performance: Capable of minimum 3/4-inch misalignment in minimum 7-inch-long assembly.
 - 4. Working Pressure Rating: Factory test at minimum 500 psig.
 - 5. Maximum Operating Temperature: 250 deg F.

2.3 VALVES AND SPECIALTIES

- A. Diaphragm Packless Valves:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Heldon Products; Henry Technologies.
 - c. Parker Hannifin Corp.
 - d. Paul Mueller Company.

2. Body and Bonnet: Forged brass or cast bronze; globe design with straight-through or angle pattern.
3. Diaphragm: Phosphor bronze and stainless steel with stainless-steel spring.
4. Operator: Rising stem and hand wheel.
5. Seat: Nylon.
6. End Connections: Socket, union, or flanged.
7. Working Pressure Rating: 500 psig.
8. Maximum Operating Temperature: 275 deg F.

B. Packed-Angle Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Heldon Products; Henry Technologies.
 - c. Parker Hannifin Corp.
 - d. Paul Mueller Company.
2. Body and Bonnet: Forged brass or cast bronze.
3. Packing: Molded stem, back seating, and replaceable under pressure.
4. Operator: Rising stem.
5. Seat: Nonrotating, self-aligning polytetrafluoroethylene.
6. Seal Cap: Forged-brass or valox hex cap.
7. End Connections: Socket, union, threaded, or flanged.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 275 deg F.

C. Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Apollo Flow Controls; Conbraco Industries, Inc.
 - b. Danfoss Inc.
 - c. Emerson Climate Technologies.
 - d. Heldon Products; Henry Technologies.
 - e. Parker Hannifin Corp.
 - f. Paul Mueller Company.
2. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
3. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.
4. Piston: Removable polytetrafluoroethylene seat.
5. Closing Spring: Stainless steel.
6. Manual Opening Stem: Seal cap, plated-steel stem, and graphite seal.
7. End Connections: Socket, union, threaded, or flanged.
8. Maximum Opening Pressure: 0.50 psig.
9. Working Pressure Rating: 500 psig.
10. Maximum Operating Temperature: 275 deg F.

D. Service Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Parker Hannifin Corp.
 - e. Paul Mueller Company.
 - f. Refrigeration Sales, Inc.
2. Body: Forged brass with brass cap including key end to remove core.
3. Core: Removable ball-type check valve with stainless-steel spring.
4. Seat: Polytetrafluoroethylene.
5. End Connections: Copper spring.
6. Working Pressure Rating: 500 psig.

E. Solenoid Valves: Comply with AHRI 760 and UL 429; listed and labeled by a National Recognized Testing Laboratory (NRTL).

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Parker Hannifin Corp.
 - e. Paul Mueller Company.
2. Body and Bonnet: Plated steel.
3. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
4. Seat: Polytetrafluoroethylene.
5. End Connections: Threaded.
6. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter, and 24-V ac coil.
7. Working Pressure Rating: 400 psig.
8. Maximum Operating Temperature: 240 deg F.

F. Thermostatic Expansion Valves: Comply with AHRI 750.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Paul Mueller Company.
2. Body, Bonnet, and Seal Cap: Forged brass or steel.
3. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.

4. Packing and Gaskets: Non-asbestos.
5. Capillary and Bulb: Copper tubing filled with refrigerant charge.
6. Suction Temperature: 40 deg F.
7. Superheat: Adjustable or Nonadjustable.
8. Reverse-flow option (for heat-pump applications).
9. End Connections: Socket, flare, or threaded union.
10. Working Pressure Rating: 700 psig.

G. Hot-Gas Bypass Valves: Comply with UL 429; listed and labeled by an NRTL.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Heldon Products; Henry Technologies.
 - c. Parker Hannifin Corp.
2. Body, Bonnet, and Seal Cap: Ductile iron or steel.
3. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
4. Packing and Gaskets: Non-asbestos.
5. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
6. Seat: Polytetrafluoroethylene.
7. Equalizer: Internal.
8. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter and 24-V ac coil.
9. End Connections: Socket.
10. Throttling Range: Maximum 5 psig.
11. Working Pressure Rating: 500 psig.
12. Maximum Operating Temperature: 240 deg F.

H. Moisture/Liquid Indicators:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Parker Hannifin Corp.
2. Body: Forged brass.
3. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
4. Indicator: Color coded to show moisture content in parts per million (ppm).
5. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
6. End Connections: Socket or flare.
7. Working Pressure Rating: 500 psig.
8. Maximum Operating Temperature: 240 deg F.

I. Replaceable-Core Filter Dryers: Comply with AHRI 730.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Parker Hannifin Corp.
2. Body and Cover: Painted-steel shell with ductile-iron cover, stainless-steel screws, and neoprene gaskets.
3. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
4. Desiccant Media: Activated alumina.
5. Designed for reverse flow (for heat-pump applications).
6. End Connections: Socket.
7. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
8. Maximum Pressure Loss: 2 psig.
9. Rated Flow: 10 tons.
10. Working Pressure Rating: 500 psig.
11. Maximum Operating Temperature: 240 deg F.

J. Permanent Filter Dryers: Comply with AHRI 730.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Danfoss Inc.
 - b. Emerson Climate Technologies.
 - c. Heldon Products; Henry Technologies.
 - d. Parker Hannifin Corp.
2. Body and Cover: Painted-steel shell.
3. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
4. Desiccant Media: Activated alumina.
5. Designed for reverse flow (for heat-pump applications).
6. End Connections: Socket.
7. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
8. Maximum Pressure Loss: 2 psig.
9. Rated Flow: 10 tons.
10. Working Pressure Rating: 500 psig.
11. Maximum Operating Temperature: 240 deg F.

K. Receivers: Comply with AHRI 495.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Heldon Products; Henry Technologies.
2. Comply with 2010 ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
3. Comply with UL 207; listed and labeled by an NRTL.
4. Body: Welded steel with corrosion-resistant coating.
5. Tappings: Inlet, outlet, liquid level indicator, and safety relief valve.
6. End Connections: Socket or threaded.
7. Working Pressure Rating: 500 psig.
8. Maximum Operating Temperature: 275 deg F.

L. Liquid Accumulators: Comply with AHRI 495.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Emerson Climate Technologies.
 - b. Heldon Products; Henry Technologies.
 - c. Parker Hannifin Corp.
2. Body: Welded steel with corrosion-resistant coating.
3. End Connections: Socket or threaded.
4. Working Pressure Rating: 500 psig.
5. Maximum Operating Temperature: 275 deg F.

2.4 REFRIGERANTS

A. ASHRAE 34, R-410A: Pentafluoroethane/Difluoromethane.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Arkema Inc.
 - b. DuPont Fluorochemicals Div.
 - c. Genetron Refrigerants; Honeywell International Inc.
 - d. Mexichem Fluor Inc.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS FOR REFRIGERANT R-410A

- A. Suction Lines NPS 1-1/2 and Smaller for Conventional Air-Conditioning Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed or soldered joints.
- B. Hot-Gas and Liquid Lines: Copper, Type ACR, annealed- or drawn-temper tubing and wrought-copper fittings with brazed or soldered joints.

3.2 VALVE AND SPECIALTY APPLICATIONS

- A. Install diaphragm packless or packed-angle valves in suction and discharge lines of compressor.
- B. Install service valves for gage taps at inlet and outlet of hot-gas bypass valves and strainers if they are not an integral part of valves and strainers.
- C. Install a check valve at the compressor discharge and a liquid accumulator at the compressor suction connection.
- D. Except as otherwise indicated, install diaphragm packless or packed-angle valves on inlet and outlet side of filter dryers.
- E. Install solenoid valves upstream from each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at top.
- F. Install thermostatic expansion valves as close as possible to distributors on evaporators.
 - 1. Install valve so diaphragm case is warmer than bulb.
 - 2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line.
 - 3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.
- G. Install moisture/liquid indicators in liquid line at the inlet of the thermostatic expansion valve or at the inlet of the evaporator coil capillary tube.
- H. Install filter dryers in liquid line between compressor and thermostatic expansion valve.
- I. Install receivers sized to accommodate pump-down charge.
- J. Install flexible connectors at compressors.

3.3 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

- B. Install refrigerant piping according to ASHRAE 15.
- C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping adjacent to machines to allow service and maintenance.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Select system components with pressure rating equal to or greater than system operating pressure.
- J. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
- K. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels as specified in Section 083113 "Access Doors and Frames" if valves or equipment requiring maintenance is concealed behind finished surfaces.
- L. Install refrigerant piping in protective conduit where installed belowground.
- M. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.
- N. Slope refrigerant piping as follows:
 - 1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
 - 2. Install horizontal suction lines with a uniform slope downward to compressor.
 - 3. Install traps and double risers to entrain oil in vertical runs.
 - 4. Liquid lines may be installed level.
- O. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.
- P. Before installation of steel refrigerant piping, clean pipe and fittings using the following procedures:
 - 1. Shot blast the interior of piping.
 - 2. Remove coarse particles of dirt and dust by drawing a clean, lintless cloth through tubing by means of a wire or electrician's tape.
 - 3. Draw a clean, lintless cloth saturated with trichloroethylene through the tube or pipe. Continue this procedure until cloth is not discolored by dirt.

4. Draw a clean, lintless cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.
 5. Finally, draw a clean, dry, lintless cloth through the tube or pipe.
 6. Safety-relief-valve discharge piping is not required to be cleaned but is required to be open to allow unrestricted flow.
- Q. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.
- R. Identify refrigerant piping and valves according to Section 230553 "Identification for HVAC Piping and Equipment."
- S. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- T. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- U. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

3.4 PIPE JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide), during brazing or welding, to prevent scale formation.
- D. Soldered Joints: Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook."
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
1. Use Type BCuP (copper-phosphorus) alloy for joining copper socket fittings with copper pipe.
 2. Use Type BAg (cadmium-free silver) alloy for joining copper with bronze or steel.
- F. Threaded Joints: Thread steel pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and to restore full ID. Join pipe fittings and valves as follows:
1. Apply appropriate tape or thread compound to external pipe threads unless dry-seal threading is specified.
 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Steel pipe can be threaded, but threaded joints must be seal brazed or seal welded.
- H. Welded Joints: Construct joints according to AWS D10.12M/D10.12.

- I. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.5 HANGERS AND SUPPORTS

- A. Comply with requirements for pipe hangers and supports specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Install the following pipe attachments:
 - 1. Adjustable steel clevis hangers for individual horizontal runs.
 - 2. Spring hangers to support vertical runs.
 - 3. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
- C. Install hangers for copper tubing with the following maximum spacing and minimum rod diameters:
 - 1. NPS 1/2: Maximum span, 60 inches; minimum rod, 1/4 inch.
 - 2. NPS 5/8: Maximum span, 60 inches; minimum rod, 1/4 inch.
 - 3. NPS 1: Maximum span, 72 inches; minimum rod, 1/4 inch.
 - 4. NPS 1-1/4: Maximum span, 96 inches; minimum rod, 3/8 inch.
 - 5. NPS 1-1/2: Maximum span, 96 inches; minimum rod, 3/8 inch.

3.6 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Comply with ASME B31.5, Chapter VI.
 - 2. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
 - 3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in "Performance Requirements" Article.
 - a. Fill system with nitrogen to the required test pressure.
 - b. System shall maintain test pressure at the manifold gage throughout duration of test.
 - c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
 - d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.
- B. Prepare test and inspection reports.

3.7 SYSTEM CHARGING

- A. Charge system using the following procedures:
 - 1. Install core in filter dryers after leak test but before evacuation.

2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.
3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
4. Charge system with a new filter-dryer core in charging line.

3.8 ADJUSTING

- A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.
- B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.
- C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.
- D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
 1. Open shutoff valves in condenser water circuit.
 2. Verify that compressor oil level is correct.
 3. Open compressor suction and discharge valves.
 4. Open refrigerant valves except bypass valves that are used for other purposes.
 5. Check open compressor-motor alignment and verify lubrication for motors and bearings.
- E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION 232300

SECTION 233113 - METAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Single-wall rectangular ducts and fittings.
2. Double-wall rectangular ducts and fittings.
3. Single-wall round ducts and fittings.
4. Sheet metal materials.
5. Sealants and gaskets.
6. Hangers and supports.

- B. Related Sections:

1. Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
2. Section 233116 "Nonmetal Ducts" for fibrous-glass ducts, thermoset fiber-reinforced plastic ducts, thermoplastic ducts, PVC ducts, and concrete ducts.
3. Section 233119 "HVAC Casings" for factory- and field-fabricated casings for mechanical equipment.
4. Section 233300 "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in Duct Construction Notes on mechanical drawings.
- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of the following products:
 - 1. Liners and adhesives.
 - 2. Sealants and gaskets.
- B. Shop Drawings:
 - 1. Factory- and shop-fabricated ducts and fittings.
 - 2. Fittings.
 - 3. Seam and joint construction.
 - 4. Penetrations through fire-rated and other partitions.
 - 5. Equipment installation based on equipment being used on Project.
 - 6. Hangers and supports, including methods for duct and building attachment and vibration isolation.
- C. Delegated-Design Submittal:
 - 1. Sheet metal thicknesses.
 - 2. Joint and seam construction and sealing.
 - 3. Reinforcement details and spacing.
 - 4. Materials, fabrication, assembly, and spacing of hangers and supports.
 - 5. Design Calculations: Calculations for selecting hangers and supports.

1.5 QUALITY ASSURANCE

- A. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."
- B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

PART 2 - PRODUCTS

2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal

Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 DOUBLE-WALL RECTANGULAR DUCTS AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. McGill Airflow LLC.
 - 2. MKT Metal Manufacturing.
 - 3. Set Duct Manufacturing.
 - 4. Sheet Metal Connectors, Inc.
- B. Rectangular Ducts: Fabricate ducts with indicated dimensions for the inner duct.
- C. Outer Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- D. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- F. Interstitial Insulation: Flexible elastomeric duct liner complying with ASTM C 534, Type II for sheet materials, and with NFPA 90A or NFPA 90B.
 - 1. Maximum Thermal Conductivity: 0.25 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.
- G. Inner Duct: Minimum 0.028-inch solid sheet steel.
- H. Formed-on Transverse Joints (Flanges): Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials

involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

- I. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SINGLE-WALL ROUND DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ductmate Industries, Inc.
 - b. Elgen Manufacturing.
 - c. Linx Industries (formerly Lindab).
 - d. McGill AirFlow LLC.
 - e. MKT Metal Manufacturing.
 - f. Nordfab Ducting.
 - g. SEMCO, LLC: part of Flaktgroup.
 - h. Set Duct Manufacturing
 - i. Sheet Metal Connectors, Inc.
 - j. Spiral Manufacturing Co., Inc.
 - k. Stamped Fittings Inc.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.4 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction

methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G90.
 - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- C. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in the "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D, No. 3, or No. 4 as indicated in the "Duct Schedule" Article.
- D. Aluminum Sheets: Comply with ASTM B 209 Alloy 3003, H14 temper; with mill finish for concealed ducts, and standard, one-side bright finish for duct surfaces exposed to view.
- E. Factory- or Shop-Applied Antimicrobial Coating:
 - 1. Apply to the surface of sheet metal that will form the interior surface of the duct. An untreated clear coating shall be applied to the exterior surface.
 - 2. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
 - 3. Coating containing the antimicrobial compound shall have a hardness of 2H, minimum, when tested according to ASTM D 3363.
 - 4. Surface-Burning Characteristics: Maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
 - 5. Shop-Applied Coating Color: Black or White.
 - 6. Antimicrobial coating on sheet metal is not required for duct containing liner treated with antimicrobial coating.
- F. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
 - 1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.
- G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.5 SEALANT AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- B. Two-Part Tape Sealing System:
 - 1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
 - 2. Tape Width: 4 inches.
 - 3. Sealant: Modified styrene acrylic.

4. Water resistant.
5. Mold and mildew resistant.
6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
7. Service: Indoor and outdoor.
8. Service Temperature: Minus 40 to plus 200 deg F.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
10. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
11. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Solvent-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Base: Synthetic rubber resin.
3. Solvent: Toluene and heptane.
4. Solids Content: Minimum 60 percent.
5. Shore A Hardness: Minimum 60.
6. Water resistant.
7. Mold and mildew resistant.
8. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
9. VOC: Maximum 395 g/L.
10. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
11. Maximum Static-Pressure Class: 10-inch wg, positive or negative.
12. Service: Indoor or outdoor.
13. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

E. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.

4. Class: 25.
 5. Use: O.
 6. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 7. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- F. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.
- G. Round Duct Joint O-Ring Seals:
1. Seal shall provide maximum 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
 2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
 3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.6 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."
- C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- D. Trapeze and Riser Supports:
1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
 2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
 3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.
- B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- C. Install round ducts in maximum practical lengths.

- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.
- K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Section 233300 "Air Duct Accessories" for fire and smoke dampers.
- L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

3.2 INSTALLATION OF EXPOSED DUCTWORK

- A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.
- B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.
- C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.
- D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.
- E. Repair or replace damaged sections and finished work that does not comply with these requirements.

3.3 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

- B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
 - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 - 2. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
 - 3. Unconditioned Space, Exhaust Ducts: Seal Class C.
 - 4. Unconditioned Space, Return-Air Ducts: Seal Class B.
 - 5. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
 - 6. Conditioned Space, Exhaust Ducts: Seal Class B.
 - 7. Conditioned Space, Return-Air Ducts: Seal Class C.

3.4 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 - 1. Where practical, install concrete inserts before placing concrete.
 - 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 - 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 - 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports.
- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.5 CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Section 233300 "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.6 PAINTING

- A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Leakage Tests:
 - 1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
 - 2. Test the following systems:
 - a. Supply Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - b. Return Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - c. Exhaust Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - d. Outdoor Air Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - 3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
 - 4. Test for leaks before applying external insulation.
 - 5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
 - 6. Give seven days' advance notice for testing.

3.8 DUCT CLEANING

- A. Clean new duct system(s) before testing, adjusting, and balancing.

3.9 START UP

- A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

END OF SECTION 233113

SECTION 233116 - NONMETAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Fibrous-glass ducts and fittings.

- B. Related Sections:

- 1. Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for nonmetal ducts.
 - 2. Section 233113 "Metal Ducts" for single- and double-wall, rectangular and round ducts.
 - 3. Section 233300 "Air Duct Accessories" for dampers, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including duct closure, reinforcements, and hangers and supports, shall comply with SMACNA's "Fibrous Glass Duct Construction Standards" and performance requirements and design criteria indicated.

- 1. Static-Pressure Classes:

- a. Supply Ducts (except in Mechanical Rooms): 1-inch wg.
 - b. Supply Ducts (in Mechanical Equipment Rooms): 2-inch wg.
 - c. Return Ducts (Negative Pressure): 1-inch wg.

- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions to comply with ASCE/SEI 7.

- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of the following products:

- 1. Fibrous-glass duct materials.

B. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Fittings.
3. Seam and joint construction.
4. Penetrations through fire-rated and other partitions.
5. Equipment installation based on equipment being used on Project.
6. Hangers and supports, including methods for duct and building attachment and vibration isolation.

C. Delegated-Design Submittal:

1. Duct materials and thicknesses.
2. Joint and seam construction and sealing.
3. Reinforcement details and spacing.
4. Design Calculations: Calculations for selecting hangers and supports.

1.5 QUALITY ASSURANCE

- A. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."
- B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."
- C. NFPA Compliance:
 1. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."
 2. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

PART 2 - PRODUCTS

2.1 FIBROUS-GLASS DUCTS AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. CertainTeed Corporation.
 2. Johns Manville; a Berkshire Hathaway company.
 3. Knauf Insulation.
 4. Owens Corning.
- B. Fibrous-Glass Duct Materials: Resin-bonded fiberglass, faced on the outside surface with fire-resistive FSK vapor retarder and with a smooth fiberglass mat finish on the air-side surface.
 1. Duct Board: Factory molded into rectangular boards.

2. Temperature Limits: 40 to 250 deg F inside ducts; 150 deg F ambient temperature surrounding ducts.
3. Maximum Thermal Conductivity: 0.24 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.
4. Moisture Absorption: Not exceeding 5 percent by weight at 120 deg F and 95 percent relative humidity for 96 hours when tested according to ASTM C 1104/C 1104M.
5. Permeability: 0.02 perms maximum when tested according to ASTM E 96/E 96M, Procedure A.
6. Antimicrobial Agent: Compound shall be tested for efficacy by an NRTL, and registered by the EPA for use in HVAC systems.
7. Noise-Reduction Coefficient: 0.65 minimum when tested according to ASTM C 423, Mounting A.
8. Required Markings: EI rating, UL label, and other markings required by UL 181 on each full sheet of duct board.

C. Closure Materials:

1. Pressure-Sensitive Tape: Comply with UL 181A; imprinted by the manufacturer with the coding "181A-P," the manufacturer's name, and a date code.
 - a. Tape: Aluminum foil-scrim tape imprinted with listing information.
 - b. Minimum Tape Width: 2-1/2 inches; 3 inches for duct board thicker than 1 inch.
 - c. Staples: 1/2-inch outward clinching, 2 inches o.c. in tabs, one tab per joint.
 - d. Water resistant.
 - e. Mold and mildew resistant.
2. Heat-Activated Tape: Comply with UL 181A; imprinted by the manufacturer with the coding "181A-H," the manufacturer's name, and a date code.
 - a. Tape: Aluminum foil-scrim tape imprinted with listing information.
 - b. Minimum Tape Width: 3 inches.
 - c. Heat-Sensitive Imprint: Printed indicator on tape to show proper heating during application has been achieved.
 - d. Water resistant.
 - e. Mold and mildew resistant.
3. Two-Part Tape Sealing System: Comply with UL 181A; imprinted by the manufacturer with the coding "181A-M," the manufacturer's name, and a date code.
 - a. Tape: Woven glass fiber impregnated with mineral gypsum.
 - b. Minimum Tape Width: 3 inches.
 - c. Sealant: Modified styrene acrylic.
 - d. Water resistant.
 - e. Mold and mildew resistant.
 - f. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - g. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Fabrication:

1. Select joints, seams, transitions, elbows, and branch connections and fabricate according to SMACNA's "Fibrous Glass Duct Construction Standards," Chapter 2, "Specifications and Closure," and Chapter 4, "Fittings and Connections."
2. Fabricate 90-degree mitered elbows to include turning vanes.
3. Reinforcements: Comply with requirements in SMACNA's "Fibrous Glass Duct Construction Standards," Chapter 5, "Reinforcement" for channel- and tie-rod reinforcement materials, spacing, and fabrication.

2.2 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size,".
- C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- D. Trapeze and Riser Supports: Steel shapes complying with ASTM A 36/A 36M.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

- A. Install ducts with fewest possible joints.
- B. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- C. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- D. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- E. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges. Overlap openings on four sides by at least 1-1/2 inches.
- F. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Section 233300 "Air Duct Accessories" for fire and smoke dampers.
- G. Protect duct interiors from the moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."
- H. Install fibrous-glass ducts and fittings to comply with SMACNA's "Fibrous Glass Duct Construction Standards."

3.2 HANGER AND SUPPORT INSTALLATION

- A. Install hangers and supports for fibrous-glass ducts and fittings to comply with SMACNA's "Fibrous Glass Duct Construction Standards," Chapter 6, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 - 1. Install concrete inserts before placing concrete.
 - 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 - 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 - 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
- C. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Leakage Tests:
 - 1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
 - 2. Test the following systems:
 - a. Supply Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - b. Return Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 50 percent of total installed duct area for each designated pressure class.
 - 3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
 - 4. Test for leaks before applying external insulation.
 - 5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test entire system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
 - 6. Give seven days' advance notice for testing.

3.4 DUCT CLEANING

- A. Clean new duct system(s) before testing, adjusting, and balancing.

3.5 START UP

- A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

3.6 DUCT SCHEDULE

- A. Indoor Ducts and Fittings:

- 1. Fibrous-Glass Rectangular Ducts and Fittings:
 - a. Minimum Flexural Rigidity: EI-800.
 - b. Minimum Board Thickness: 1-1/2 inches.

END OF SECTION 233116

SECTION 233300 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Backdraft and pressure relief dampers.
2. Manual volume dampers.
3. Control dampers.
4. Fire dampers.
5. Turning vanes.
6. Flexible connectors.
7. Flexible ducts.
8. Duct accessory hardware.

- B. Related Requirements:

1. Section 233723 "HVAC Gravity Ventilators" for roof-mounted ventilator caps.
2. Section 284612 "Addressable Fire-Alarm Systems" for duct-mounted fire and smoke detectors.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. For duct silencers, include pressure drop and dynamic insertion loss data. Include breakout noise calculations for high transmission loss casings.

- B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.

1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
 - a. Special fittings.
 - b. Manual volume damper installations.
 - c. Control-damper installations.
 - d. Fire-damper installations, including sleeves; and duct-mounted access doors and remote damper operators.

- e. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which ceiling-mounted access panels and access doors required for access to duct accessories are shown and coordinated with each other, using input from Installers of the items involved.
- B. Source quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.2 MATERIALS

- A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G90.
 - 2. Exposed-Surface Finish: Mill phosphatized.
- B. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and finish for exposed ducts.
- C. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.
- D. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.
- E. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- F. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 BACKDRAFT AND PRESSURE RELIEF DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Warming and Ventilating; a Mestek Architectural Group company.
 2. Cesco Products; a division of MESTEK, Inc.
 3. Greenheck Fan Corporation.
 4. Lloyd Industries, Inc.
 5. Nailor Industries Inc.
 6. NCA Manufacturing, Inc.
 7. Pottorff.
 8. Ruskin Company.
 9. Safe Air – Dowco Products.
 10. United Enertech.
 11. Vent Products Co., Inc.
- B. Description: Gravity balanced.
- C. Maximum Air Velocity: 1000 fpm.
- D. Maximum System Pressure: 1-inch wg.
- E. Frame: Hat-shaped, 0.05-inch-thick galvanized sheet steel or 0.063-inch-thick extruded aluminum with welded corners or mechanically attached and mounting flange.
- F. Blades: Multiple single-piece blades, center pivoted, maximum 6-inch width, 0.050-inch-thick aluminum sheet noncombustible, tear-resistant, neoprene-coated fiberglass with sealed edges.
- G. Blade Action: Parallel.
- H. Blade Seals: Neoprene, mechanically locked.
- I. Blade Axles:
1. Material: Galvanized steel or Aluminum.
 2. Diameter: 0.20 inch.
- J. Tie Bars and Brackets: Aluminum or Galvanized steel.
- K. Return Spring: Adjustable tension.
- L. Bearings: Steel ball or synthetic pivot bushings.
- M. Accessories:
1. Adjustment device to permit setting for varying differential static pressure.
 2. Counterweights and spring-assist kits for vertical airflow installations.
 3. Electric actuators.
 4. Chain pulls.

5. Screen Mounting: Front mounted in sleeve.
 - a. Sleeve Thickness: 20 gage minimum.
 - b. Sleeve Length: 6 inches minimum.
6. Screen Mounting: Rear mounted.
7. Screen Material: Galvanized steel or Aluminum.
8. Screen Type: Bird.
9. 90-degree stops.

2.4 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Air Balance; a division of MESTEK, Inc.
 - b. Aire Technologies.
 - c. American Warming and Ventilating; a Mestek Architectural Group company.
 - d. Arrow United Industries.
 - e. Cesco Products; a division of MESTEK, Inc.
 - f. Greenheck Fan Corporation.
 - g. Lloyd Industries, Inc.
 - h. McGill AirFlow LLC.
 - i. Nailor Industries Inc.
 - j. Pottorff.
 - k. Ruskin Company.
 - l. Safe Air – Dowco Products.
 - m. United Enertech.
 - n. Vent Products Co., Inc.
2. Standard leakage rating.
3. Suitable for horizontal or vertical applications.
4. Frames:
 - a. Frame: Hat-shaped, 0.094-inch-thick, galvanized sheet steel.
 - b. Mitered and welded corners.
 - c. Flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:
 - a. Multiple or single blade.
 - b. Parallel- or opposed-blade design.
 - c. Stiffen damper blades for stability.
 - d. Galvanized-steel, 0.064 inch thick.
6. Blade Axles: Galvanized steel.
7. Bearings:

- a. Oil-impregnated bronze.
 - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
8. Tie Bars and Brackets: Galvanized steel.
- B. Standard, Aluminum, Manual Volume Dampers:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Warming and Ventilating; a Mestek Architectural Group company.
 - b. Arrow United Industries.
 - c. Cesco Products; a division of MESTEK, Inc.
 - d. Lloyd Industries, Inc.
 - e. McGill AirFlow LLC.
 - f. Nailor Industries Inc.
 - g. Pottorff.
 - h. Ruskin Company.
 - i. Safe Air – Dowco Products.
 - j. United Enertech.
 - k. Vent Products Co., Inc.
 2. Standard leakage rating.
 3. Suitable for horizontal or vertical applications.
 4. Frames: Hat-shaped, 0.10-inch-thick, aluminum sheet channels; frames with flanges for attaching to walls and flangeless frames for installing in ducts.
 5. Blades:
 - a. Multiple or single blade.
 - b. Parallel- or opposed-blade design.
 - c. Stiffen damper blades for stability.
 - d. Roll-Formed Aluminum Blades: 0.10-inch-thick aluminum sheet.
 - e. Extruded-Aluminum Blades: 0.050-inch-thick extruded aluminum.
 6. Blade Axles: Galvanized steel.
 7. Bearings:
 - a. Oil-impregnated bronze.
 - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
 8. Tie Bars and Brackets: Aluminum.
- C. Damper Hardware:
 1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch-thick zinc-plated steel, and a 3/4-inch hexagon locking nut.
 2. Include center hole to suit damper operating-rod size.
 3. Include elevated platform for insulated duct mounting.

2.5 CONTROL DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Warming and Ventilating; a Mestek Architectural Group company.
 2. Arrow United Industries.
 3. Carnes Company.
 4. Cesco Products; a division of MESTEK, Inc.
 5. Greenheck Fan Corporation.
 6. Lloyd Industries, Inc.
 7. McGill AirFlow LLC.
 8. Metal Form Manufacturing, Inc.
 9. Nailor Industries Inc.
 10. NCA Manufacturing, Inc.
 11. Pottorff.
 12. Ruskin Company.
 13. Safe Air – Dowco Products.
 14. United Enertech.
 15. Vent Products Co., Inc.
 16. Young Regulator Company.
- B. Low-leakage rating and bearing AMCA's Certified Ratings Seal for both air performance and air leakage.
- C. Frames:
1. Hat shaped.
 2. 0.094-inch-thick, galvanized sheet steel.
 3. Mitered and welded corners.
- D. Blades:
1. Multiple blade with maximum blade width of 6 inches.
 2. Opposed-blade design.
 3. Galvanized-steel or Aluminum.
 4. 0.064 inch thick single skin.
 5. Blade Edging: Closed-cell neoprene.
 6. Blade Edging: Inflatable seal blade edging, or replaceable rubber seals.
- E. Blade Axles: 1/2-inch-diameter; galvanized steel blade-linkage hardware of zinc-plated steel and brass; ends sealed against blade bearings.
1. Operating Temperature Range: From minus 40 to plus 200 deg F.
- F. Bearings:
1. Oil-impregnated bronze.
 2. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
 3. Thrust bearings at each end of every blade.

2.6 FIRE DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Air Balance; a division of MESTEK, Inc.
 2. Aire Technologies.
 3. Arrow United Industries.
 4. Cesco Products; a division of MESTEK, Inc.
 5. CL WARD & Family Inc.
 6. Greenheck Fan Corporation.
 7. NCA Manufacturing, Inc.
 8. Pottorff.
 9. Prefco.
 10. Ruskin Company.
 11. Safe Air – Dowco Products.
 12. United Enertech.
 13. Vent Products Co., Inc.
- B. Type: Dynamic; rated and labeled according to UL 555 by an NRTL.
- C. Closing rating in ducts up to 4-inch wg static pressure class and minimum 2000-fpm velocity.
- D. Fire Rating: 1-1/2 hours.
- E. Frame: Curtain type with blades outside airstream; fabricated with roll-formed, 0.034-inch- thick galvanized steel; with mitered and interlocking corners.
- F. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.
1. Minimum Thickness: 0.05, 0.138 inch or 0.39 inch thick, as indicated, and of length to suit application.
 2. Exception: Omit sleeve where damper-frame width permits direct attachment of perimeter mounting angles on each side of wall or floor; thickness of damper frame must comply with sleeve requirements.
- G. Mounting Orientation: Vertical or horizontal as indicated.
- H. Blades: Roll-formed, interlocking, 0.024-inch-thick, galvanized sheet steel. In place of interlocking blades, use full-length, 0.034-inch-thick, galvanized-steel blade connectors.
- I. Horizontal Dampers: Include blade lock and stainless-steel closure spring.
- J. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.

2.7 TURNING VANES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Aero-Dyne Sound Control Co.
 2. CL WARD & Family Inc.
 3. Ductmate Industries, Inc.
 4. Duro Dyne, Inc.
 5. DynAir; a Carlisle Company.
 6. Elgen Manufacturing.
 7. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.
- C. Manufactured Turning Vanes for Nonmetal Ducts: Fabricate curved blades of resin-bonded fiberglass with acrylic polymer coating; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
- D. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."
- E. Vane Construction: Single wall.

2.8 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CL WARD & Family Inc.
 2. Ductmate Industries, Inc.
 3. Duro Dyne, Inc.
 4. DynAir; a Carlisle Company.
 5. Elgen Manufacturing.
 6. Ventfabrics, Inc.
 7. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Materials: Flame-retardant or noncombustible fabrics.
- C. Coatings and Adhesives: Comply with UL 181, Class 1.
- D. Metal-Edged Connectors: Factory fabricated with a fabric strip 5-3/4 inches wide attached to two strips of 2-3/4-inch-wide, 0.028-inch-thick, galvanized sheet steel or 0.032-inch-thick aluminum sheets. Provide metal compatible with connected ducts.
- E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
1. Minimum Weight: 26 oz./sq. yd.
 2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
 3. Service Temperature: Minus 40 to plus 200 deg F.

- F. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.
 - 1. Minimum Weight: 24 oz./sq. yd.
 - 2. Tensile Strength: 530 lbf/inch in the warp and 440 lbf/inch in the filling.
 - 3. Service Temperature: Minus 50 to plus 250 deg F.
- G. High-Temperature System, Flexible Connectors: Glass fabric coated with silicone rubber.
 - 1. Minimum Weight: 16 oz./sq. yd.
 - 2. Tensile Strength: 285 lbf/inch in the warp and 185 lbf/inch in the filling.
 - 3. Service Temperature: Minus 67 to plus 500 deg F.
- H. Thrust Limits: Combination coil spring and elastomeric insert with spring and insert in compression, and with a load stop. Include rod and angle-iron brackets for attaching to fan discharge and duct.
 - 1. Frame: Steel, fabricated for connection to threaded rods and to allow for a maximum of 30 degrees of angular rod misalignment without binding or reducing isolation efficiency.
 - 2. Outdoor Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 - 3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 - 4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 - 5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 - 6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
 - 7. Coil Spring: Factory set and field adjustable for a maximum of 1/4-inch movement at start and stop.

2.9 FLEXIBLE DUCTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Flexmaster U.S.A., Inc.
 - 2. JP Lamborn Co.
 - 3. McGill AirFlow LLC.
 - 4. Thermaflex; a Flex-Tek Group Company.
 - 5. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Insulated, Flexible Duct: UL 181, Class 1, multiple layers of aluminum laminate supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene vapor-barrier film.
 - 1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
 - 2. Maximum Air Velocity: 4000 fpm.
 - 3. Temperature Range: Minus 20 to plus 210 deg F.
 - 4. Insulation R-value: Comply with ASHRAE/IESNA 90.1.

C. Flexible Duct Connectors:

1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.
2. Non-Clamp Connectors: Adhesive, liquid adhesive plus tape, or adhesive plus sheet metal screws.

2.10 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.
- C. Install backdraft dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.
- D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
 1. Install steel volume dampers in steel ducts.
 2. Install aluminum volume dampers in aluminum ducts.
- E. Set dampers to fully open position before testing, adjusting, and balancing.
- F. Install test holes at fan inlets and outlets and elsewhere as indicated.
- G. Install fire dampers according to UL listing.
- H. Install flexible connectors to connect ducts to equipment.

- I. Connect terminal units to supply ducts directly or with maximum 12-inch lengths of flexible duct. Do not use flexible ducts to change directions.
- J. Connect diffusers to ducts directly or with maximum 60-inch lengths of flexible duct clamped or strapped in place.
- K. Connect flexible ducts to metal ducts with adhesive, liquid adhesive plus tape, or adhesive plus sheet metal screws.
- L. Install duct test holes where required for testing and balancing purposes.
- M. Install thrust limits at centerline of thrust, symmetrical on both sides of equipment. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch movement during start and stop of fans.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:

- 1. Operate dampers to verify full range of movement.
- 2. Inspect locations of access doors and verify that purpose of access door can be performed.
- 3. Operate fire dampers to verify full range of movement and verify that proper heat-response device is installed.
- 4. Inspect turning vanes for proper and secure installation.
- 5. Operate remote damper operators to verify full range of movement of operator and damper.

END OF SECTION 233300

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Rectangular and square ceiling diffusers.
 - 2. Perforated diffusers.
 - 3. Louver face diffusers.
 - 4. Adjustable bar registers and grilles.
 - 5. Fixed face registers and grilles.
- B. Related Sections:
 - 1. Section 089119 "Fixed Louvers" for fixed louvers and wall vents, whether or not they are connected to ducts.
 - 2. Section 233300 "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, include the following:
 - 1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
 - 2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
 - 1. Ceiling suspension assembly members.
 - 2. Method of attaching hangers to building structure.
 - 3. Size and location of initial access modules for acoustical tile.
 - 4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 5. Duct access panels.

- B. Source quality-control reports.

PART 2 - PRODUCTS

2.1 CEILING DIFFUSERS

- A. See Air Device Schedule on mechanical drawings for type, make, model and description.

2.2 SOURCE QUALITY CONTROL

- A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 233713

SECTION 233723 - HVAC GRAVITY VENTILATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Roof hoods.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 2. AWS D1.3, "Structural Welding Code - Sheet Steel."

1.5 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5 or T-52.
- B. Aluminum Sheet: ASTM B 209 , Alloy 3003 or 5005 with temper as required for forming or as otherwise recommended by metal producer for required finish.
- C. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 zinc coating, mill phosphatized.
- D. Stainless-Steel Sheet: ASTM A 666, Type 304, with No. 4 finish.

- E. Fasteners: Same basic metal and alloy as fastened metal or 300 Series stainless steel unless otherwise indicated. Do not use metals that are incompatible with joined materials.
 - 1. Use types and sizes to suit unit installation conditions.
 - 2. Use Phillips flat, or hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.
- F. Post-Installed Fasteners for Concrete and Masonry: Torque-controlled expansion anchors made from stainless-steel components, with capability to sustain without failure a load equal to 4 times the loads imposed for concrete, or 6 times the load imposed for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
- G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.2 FABRICATION, GENERAL

- A. Factory or shop fabricate gravity ventilators to minimize field splicing and assembly. Disassemble units to the minimum extent as necessary for shipping and handling. Clearly mark units for reassembly and coordinated installation.
- B. Fabricate frames, including integral bases, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
- C. Fabricate units with closely fitted joints and exposed connections accurately located and secured.
- D. Fabricate supports, anchorages, and accessories required for complete assembly.
- E. Perform shop welding by AWS-certified procedures and personnel.

2.3 ROOF HOODS

- A. See Gravity Roof Vent schedule on mechanical drawings for type, model and description.
- B. Factory or shop fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figures 6-6 and 6-7.
- C. Materials: Galvanized-steel sheet, minimum 0.064-inch-thick base and 0.040-inch-thick hood or Aluminum sheet, minimum 0.063-inch-thick base and 0.050-inch-thick hood; suitably reinforced.
- D. Roof Curbs: Galvanized-steel sheet; with mitered and welded corners; 1-1/2-inch-thick, rigid fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to fit roof opening and ventilator base.
 - 1. Configuration: Built-in raised cant and mounting flange.
 - 2. Overall Height: 12 inches.
- E. Insect Screening: Aluminum, 18-by-16 mesh, 0.012-inch or Stainless-steel, 18-by-18 mesh, 0.009-inch wire.

F. Galvanized-Steel Sheet Finish:

1. Surface Preparation: Clean surfaces of dirt, grease, and other contaminants. Clean welds, mechanical connections, and abraded areas and repair galvanizing according to ASTM A 780. Apply a conversion coating suited to the organic coating to be applied over it.
2. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply an air-dried primer immediately after cleaning and pretreating.
3. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil for topcoat and an overall minimum dry film thickness of 2 mils.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range.

G. Capacities and Characteristics:

1. See Gravity Roof Vent schedule on mechanical drawings for capacities and characteristics.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install gravity ventilators level, plumb, and at indicated alignment with adjacent work.
- B. Install gravity ventilators with clearances for service and maintenance.
- C. Install perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- D. Install concealed gaskets, flashings, joint fillers, and insulation as installation progresses. Comply with Section 079200 "Joint Sealants" for sealants applied during installation.
- E. Label gravity ventilators according to requirements specified in Section 230553 "Identification for HVAC Piping and Equipment."
- F. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
- G. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.

3.2 CONNECTIONS

- A. Duct installation and connection requirements are specified in Section 233113 "Metal Ducts". Drawings indicate general arrangement of ducts and duct accessories.

3.3 ADJUSTING

- A. Adjust damper linkages for proper damper operation.

END OF SECTION 233723

SECTION 238126 - SPLIT-SYSTEM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes split-system air-conditioning and heat-pump units consisting of separate evaporator-fan and compressor-condenser components.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For split-system air-conditioning units to include in emergency, operation, and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Filters: One set(s) for each air-handling unit.

2. Gaskets: One set(s) for each access door.
3. Fan Belts: One set(s) for each air-handling unit fan.

1.7 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE Compliance:
 1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
 2. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - "Procedures," and Section 7 - "Construction and System Start-up."
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

1.8 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork are specified in Section 033000 "Cast-in-Place Concrete."
- B. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.
 1. Warranty Period:
 - a. For Compressor: Five year(s) from date of Substantial Completion.
 - b. For Parts: One year(s) from date of Substantial Completion.
 - c. For Labor: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. See Split System Air Conditioning Unit Schedule on mechanical drawings for type, make, model and description.

2.2 INDOOR UNITS 5 TONS OR LESS

A. Concealed Evaporator-Fan Components:

1. Chassis: Galvanized steel with flanged edges, removable panels for servicing, and insulation on back of panel.
2. Insulation: Faced, glass-fiber duct liner.
3. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 206/110.
4. Water Coil: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch; leak tested to 300 psig underwater; with a two-position control valve.
5. Electric Coil: Helical, nickel-chrome, resistance-wire heating elements; with refractory ceramic support bushings, automatic-reset thermal cutout, built-in magnetic contactors, manual-reset thermal cutout, airflow proving device, and one-time fuses in terminal box for overcurrent protection.
6. Fan: Forward-curved, double-width wheel of galvanized steel; directly connected to motor.
7. Fan Motors:
 - a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
 - b. Multitapped, multispeed with internal thermal protection and permanent lubrication.
 - c. Wiring Terminations: Connect motor to chassis wiring with plug connection.
8. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
9. Filters: Permanent, cleanable.
10. Condensate Drain Pans:
 - a. Fabricated with one percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and humidifiers, and to direct water toward drain connection.
 - 1) Length: Extend drain pan downstream from leaving face to comply with ASHRAE 62.1.
 - 2) Depth: A minimum of 2 inches deep.
 - b. Double-wall, galvanized-steel sheet with space between walls filled with foam insulation and moisture-tight seal.
 - c. Drain Connection: Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on both ends of pan.
 - 1) Minimum Connection Size: NPS 1.
 - d. Provide condensate pump as required for condensate drainage, wired into unit fan start.

2.3 OUTDOOR UNITS 5 TONS OR LESS

A. Air-Cooled, Compressor-Condenser Components:

1. Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.
2. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.
 - a. Compressor Type: Scroll.
 - b. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
 - c. Refrigerant Charge: R-410A.
 - d. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 206/110.
3. Heat-Pump Components: Reversing valve and low-temperature-air cutoff thermostat.
4. Fan: Aluminum-propeller type, directly connected to motor.
5. Motor: Permanently lubricated, with integral thermal-overload protection.
6. Low Ambient Kit: Permits operation down to 45 deg F.
7. Mounting Base: Polyethylene.

2.4 ACCESSORIES

- A. Thermostat: Low voltage with subbase to control compressor and evaporator fan.
- B. Automatic-reset timer to prevent rapid cycling of compressor.
- C. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.
- D. Drain Hose: For condensate.

2.5 CAPACITIES AND CHARACTERISTICS

- A. See Split System Air Conditioning Unit Schedule on mechanical drawings for capacities and characteristics.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install units level and plumb.
- B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.
- C. Equipment Mounting:
 1. Install ground-mounted, compressor-condenser components on concrete equipment bases.

2. Comply with requirements for vibration isolation devices specified in Section 230548.13 "Vibration Controls for HVAC."

- D. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

- A. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.
- B. Duct Connections: Duct installation requirements are specified in Section 233113 "Metal Ducts." Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Section 233300 "Air Duct Accessories."

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Remove and replace malfunctioning units and retest as specified above.
- E. Prepare test and inspection reports.

3.4 STARTUP SERVICE

- A. Perform startup service.
 1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 238126

SECTION 26 00 10 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL

- A. Basic Requirements: The Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- B. General Provisions: Provide all labor, materials, equipment, and incidentals required to make ready for use complete electrical systems as specified herein and shown on the drawings.
- C. Provide and Install: The word "provide" where used on the Drawings or in the Specifications shall mean "furnish, install, mount, connect, test, complete, and make ready for operation". The word "install" where used on the Drawings or in the Specifications shall mean "mount, connect, test, complete, and make ready for operation". Perform work required by, and in accordance with, the Contract Documents.
- D. Installation: Provide and place in satisfactory condition, ready for proper operation, raceways, wires, cables, and other material needed for all complete electrical systems required by the Contract Documents. Additional raceways and wiring shall be provided to complete the installation of the specific equipment provided. Include auxiliaries and accessories for complete and properly operating systems. Provide electrical systems and accessories to comply with the NEC, state and local codes and ordinances. It is the intent of these Specifications that the electrical systems be suitable in every way for the use intended. Material and work which is incidental to the work of this Contract shall be provided at no additional cost to the Contract.
- E. Field Connections: Provide field connections to remote equipment and control panels provided under other Divisions of these Specifications. Install field connections to "packaged" equipment provided under other Divisions of these Specifications.

1.2 SCOPE OF WORK

- A. General: Provide labor, materials, permits, inspections and re-inspection fees, tools, equipment, transportation, insurance, temporary protection, temporary power and lighting, supervision and incidental items essential for proper installation and operation of the Electrical systems indicated in the Contract Documents. Provide materials not specifically mentioned or indicated but which are usually provided or are essential for proper installation and operation of the Electrical systems indicated in the contract documents.
- B. Notices: Give notices, file Plans, pay fees, and obtain permits and approvals from authorities having jurisdiction. Include all fees in the Bid Price.

1.3 INTERPRETATION OF DRAWINGS

- A. General: The Drawings are diagrammatic and are not intended to show exact locations of Raceway runs, outlet boxes, junction boxes, pull boxes, etc. The locations of equipment, appliances, fixtures, Raceways, outlets, boxes and similar devices shown on the Drawings are approximate only. Exact locations shall be determined and coordinated in the field. The right is reserved to change, without additional cost, the location of any outlet within the same room or general area before it is permanently installed. Obtain all information relevant to the placing of electrical work and in case of interference with other work, proceed as directed by the Architect.
- B. Discrepancies: Notify the Architect of any discrepancies found during construction of the project. The Architect will provide written instructions as to how to proceed with that portion of work. If a conflict exists between the Contract Documents and an applicable code or standard, the most stringent requirement shall apply.
- C. Wiring: Each three-phase circuit shall be run in a separate Raceway unless otherwise shown on the Drawings. Unless otherwise accepted by the Architect, Raceway shall not be installed exposed. Where circuits are shown as "home runs" all necessary fittings, supports, and boxes shall be provided for a complete raceway installation.
- D. Layout: Circuit layouts are not intended to show the number of fittings, or other installation details. Connections to equipment shall be made as required, and in accordance with the accepted shop and manufacturer's setting drawings.
- E. Coordination: Coordinate final equipment locations with drawings or other disciplines. Layout before installation so that all trades may install equipment in available space. Provide coordination as required for installation in a neat and workmanlike manner.

1.4 EQUIPMENT SIZE AND HANDLING

- A. Coordination: Investigate each space in the structure through which equipment must pass to reach its final location. If necessary, ship the equipment in sections of specific sizes to permit the passing through the necessary areas within the structure.
- B. Handling: Equipment shall be kept upright at all times. When equipment has to be tilted for ease of passage through restricted areas during transportation, the manufacturer shall be required to brace the equipment suitably, to insure that the tilting does not impair the functional integrity of the equipment.

1.5 RECORD DRAWINGS

- A. The Contractor shall provide "As-Built Documents". The "As-Built" drawings shall accurately reflect installed work.

1.6 CODES, FEES, AND STANDARDS

- A. The codes, standards and practices listed herein generally apply to the entire project and specification sections. Other codes, standards or practices that are more specific will be referenced within a particular specification.
- B. All materials and types of construction covered in the specifications will be required to meet or exceed applicable standards of manufacturer, testing, performance, and installation according to the requirements of UL, ANSI, NEMA, IEEE, and NEC referenced documents where indicated and the manufacturer's recommended practices. Requirements indicated on the contract documents that exceed but are not contrary to governing codes shall be followed.
- C. The installation shall comply with the governing state and local codes or ordinances. The completed electrical installation shall be inspected and certified by applicable agencies that it is in compliance with codes.
- D. Materials and equipment shall be new and free of defects, and shall be U.L. listed, bear the U.L. label or be labeled or listed with an approved, nationally recognized Electrical Testing Agency. Where no labeling or listing service is available or desired for certain types of equipment, test data shall be submitted to validate that equipment meets or exceeds available standards.

1.7 SUPERVISION OF THE WORK

- A. Provide one field superintendent who has had a minimum of four (4) years previous successful experience on projects of comparable sizes, type and complexity. The Superintendent shall be present at all times when work is being performed. At least one member of the Electrical Contracting Firm shall hold a State Master Certificate of Competency.

1.8 COORDINATION

- A. General: Compare drawings and specifications with those of other trades and report any discrepancies between them to the Architect. Obtain from the Architect written instructions to make the necessary changes in any of the affected work. Work shall be installed in cooperation with other Trades installing interrelated work. Before installation, Trades shall make proper provisions to avoid interferences in a manner approved by the Architect.
- B. Provide all required coordination and supervision where work connects to or is affected by work of others, and comply with all requirements affecting this Division. Work required under other divisions, specifications or drawings to be performed by this Division shall be coordinated with the Contractor and such work performed at no additional cost to Owner.
- C. Obtain a complete set of Contract Documents from Owner's Authorized Representative or Contractor for all areas of work and include all electrical work in bid price whether included in Division 26 Contract Documents or not.

- D. Secure approved shop drawings from all required disciplines and verify final electrical characteristics before roughing power feeds to any equipment. When electrical data on approved shop drawings differs from that shown or called for in Construction Documents, make adjustments to the wiring, disconnects, and branch circuit protection to match that required for the equipment installed.
- E. Damage from interference caused by inadequate coordination shall be corrected at no additional cost to the Owner.
- F. Adjustments: Locations of raceway and equipment shall be adjusted to accommodate the work with interferences anticipated and encountered. Determine the exact routing and location of systems prior to fabrication or installation.
- G. Priorities: Lines which pitch shall have the right of way over those which do not pitch. For example, plumbing drains shall normally have the right of way. Lines whose elevations cannot be changed shall have the right of way over lines whose elevations can be changed.
- H. Modifications: Offsets and changes of direction in raceway systems shall be made to maintain proper headroom and pitch of sloping lines whether or not indicated on the drawings. Provide elbows, boxes, etc., as required to allow offsets and changes to suit job conditions.
- I. Replacement: Work shall be installed in a way to permit removal (without damage to other parts) of other system components provided under this Contract requiring periodic replacement or maintenance. Raceway shall be arranged in a manner to clear the openings of swinging overhead access doors as well as ceiling tiles.
- J. Layout: The Contract Drawings are diagrammatic only intending to show general runs and locations of raceway and equipment, and not necessarily showing required offsets, details and accessories and equipment to be connected. Work shall be accurately laid out with other Trades to avoid conflicts and to obtain a neat and workmanlike installation, which will afford maximum accessibility for operation, maintenance and headroom.
- K. Contract Conflicts: Where discrepancies exist in the Scope of Work as to what Trade provides items such as starters, disconnects, flow switches, etc. such conflicts shall be coordinated between the divisions involved. It is the intent of the Contract Documents that all work shall be provided complete as one bid price.
- L. Drawing Conflicts: Where drawing details, plans or specification requirements are in conflict and where sizes of the same item run are shown to be different within the contract documents, the most stringent requirement shall be included in the Contract. Systems and equipment called for in the specification or as shown on the drawings shall be provided as if it was required by both the drawings and specifications. Prior to ordering or installation of any portion of work, which appears to be in conflict, such work shall be brought to Architect's attention for direction as to what is to be provided.
- M. It is the responsibility of this Contractor to coordinate the exact required location of floor outlets, floor ducts, floor stub-ups, etc. with Owner's Authorized Representative and Designer (and receive their approval) prior to rough-in. Locations indicated in Contract Documents are only approximate locations.

- N. The Contract Documents describe specific sizes of switches, breakers, fuses, Raceways, conductors, motor starters and other items of wiring equipment. These sizes are based on specific items of power consuming equipment (heaters, lights, motors for fans, compressors, pumps, etc.). Coordinate the requirements of each load with each load's respective circuitry shown and with each load's requirements as noted on its nameplate data and manufacturer's published electrical criteria. Adjust circuit breaker, fuse, Raceway, and conductor sizes to meet the actual requirements of the equipment being provided and installed and change from single point to multiple points of connection (or vice versa) to meet equipment requirements. Changes shall be made at no additional cost to the Owner.
- O. Working Clearances: Minimum working clearances about electrical equipment shall be as referenced in the applicable edition NEC Article 110, and shall include equipment installed in ceiling spaces.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Specified Method: Where several brand names, make or manufacturers are listed as acceptable each shall be regarded as equally acceptable, based on the design selection but each must meet all specification requirements. Where a manufacturer's model number is listed, this model shall set the standard of quality and performance required. Where no brand name is specified, the source and quality shall be subject to Engineer's review and acceptance. Where manufacturers are listed, one of the listed manufacturers shall be submitted for acceptance. No substitutions are permitted.
- B. Certification: When a product is specified to be in accordance with a trade association or government standard requested by the Engineer, Contractor shall provide a certificate that the product complies with the referenced standard. Upon request of Engineer, Contractor shall submit supporting test data to substantiate compliance.
- C. Basis of Bid: Each bidder represents that his bid is based upon the manufacturer's, materials, and equipment described in the Contract Documents.
- D. Space Requirements: Equipment or optional equipment shall conform to established space requirements within the project. Equipment which does not meet space requirements, shall be replaced at no additional expense to the Contract. Modifications of related systems shall be made at no additional expense to the Contract. Submit modifications to the Architect/Engineer for acceptance.

2.2 SHOP DRAWINGS

- A. General: Shop drawings shall be submitted for every item listed within the Submittals section each individual specification section. One copy shall be submitted to the engineer prior to ordering equipment. Refer to Basis of approval paragraph.

- B. Responsibility: It is the Contractors responsibility to provide material in accordance with the plans and specifications. Material not provided in accordance with the plans and specifications shall be removed and replaced at the Contractors expense.
- C. Official Record: The shop drawing submittal shall become the official record of the materials to be installed. If materials are installed which do not correspond to the record submittal they shall be removed from the project without any additional cost or delays in construction completion.
- D. Basis of Review: Approval is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Contractor is responsible for quantities, dimensions, fabrication processes, and construction techniques.
- E. Responsibility: The responsibility that dimensions are confirmed and correlated with proper coordination of other trades shall be included as part of the Contract Documents. The responsibility and the necessity of providing materials and workmanship required by the Specifications and Drawings which may not be indicated on the shop drawings shall be included as part of the Contract Documents. The Contractor is responsible for any delays in job progress occurring directly or indirectly from late submissions or re-submissions of shop drawings, product data, or samples.
- F. Ordering Equipment: No material shall be ordered or shop work started until the Engineer has officially received the shop drawings record submittal and has formally released the Contractor for submittal requirements.

2.3 EQUIPMENT, MATERIALS, AND SUPPORTS

- A. General: Each item of equipment or material shall be manufactured by a company regularly engaged in the manufacturer of the type and size of equipment, shall be suitable for the environment in which it is to be installed, shall be approved for its purpose, environment, and application, and shall bear the UL label.
- B. Installation Requirements: Each item of equipment or material shall be installed in accordance with instructions and recommendations of the manufacturer, however, the methods shall not be less stringent than specified herein.
- C. Required Accessories: Provide all devices and materials, such as expansion bolts, foundation bolts, screws, channels, angles, and other attaching means, required to fasten enclosures, raceways, and other electrical equipment and materials to be mounted on structures which are existing or new.
- D. Protection: Electrical equipment shall at all times during construction be adequately protected against mechanical injury or damage by the elements. Equipment shall be stored in dry permanent shelters. If apparatus has been damaged, such damage shall be repaired at no additional cost or time extension to the Contract. If apparatus has been subject to possible injury, it shall be thoroughly cleaned, dried out and put through tests as directed by the Manufacturer and Engineer, or shall be replaced, if directed by the Engineer, at no additional cost to the Contract.

2.4 IDENTIFICATION OF EQUIPMENT

- A. General: Electrical items shall be identified as specified in the Contract Documents. Such identification shall be in addition to the manufacturer's nameplates and shall serve to identify the item's function and the equipment or system, which it serves or controls. Refer to Identification Section of the specifications for additional information.

2.5 CONCRETE PADS

- A. General: Provide reinforced concrete pads for floor mounted electrical equipment. Unless otherwise noted, pads shall be nominal four (4) inches high and shall exceed dimensions of equipment being set on them, including future sections, by six (6) inches on all sides, except when equipment is flush against a wall, then the side or sides against the wall shall be flush with the equipment. Chamfer top edges 1/2". Trowel surfaces smooth. Reinforce pads with #5 reinforcing bars at 24" centers each way, unless specifically detailed on drawings.

2.6 SURFACE MOUNTED EQUIPMENT

- A. General: Surface mounted fixtures, outlets, cabinets, panels, etc. shall have a factory-applied finish or shall be painted as accepted by Engineer. Raceways and fittings, where allowed to be installed surface mounted, shall be painted to match the finish on which it was installed. Paint shall be in accordance with other applicable sections of these specifications.

2.7 CUTTING AND PATCHING

- A. Core Drilling: The Contractor shall be responsible for core drilling as required for work under this section, but in no case shall the Contractor cut into or weld onto any structural element of the project without the written approval of the Architect.
- B. Cutting and Patching: Cutting, rough patching and finish patching shall be provided as specified in the contract documents. Cutting and patching shall be performed in a neat and workmanlike manner. Upon completion, the patched area shall match adjacent surfaces.
- C. Openings and Sleeves: Locate openings required for work performed under this section. Provide sleeves, guards or other accepted methods to allow passage of items installed under this section.
- D. Roof Penetration: Provide roofer with pitch pans, fittings, etc., required for electrical items which penetrate the roof. Roof penetrations are to be waterproofed in such a manner that roofing guarantees are fully in force. Roof penetrations shall be coordinated with other Trades to ensure that roof warranty is not invalidated.

2.8 SLEEVES AND FORMS FOR OPENINGS

- A. Sleeves: Provide sleeves for Raceways penetrating floors, walls, partitions, etc. Locate necessary slots for electrical work and form before concrete is poured. Watertight sleeves shall be line seal type WS. Fire rated partition sleeves shall be mild steel. Sleeves shall be Schedule 40 PVC or galvanized rigid steel unless specifically noted otherwise. Size shall be one standard diameter larger than pipe being installed or of a larger diameter to below 1/4" minimum clearance.
- B. Forms: Provide boxed out forms for Raceway penetrations only where allowed by the Architect. Fill opening after Raceway installation, with equivalent material.

2.9 SERVICE AND METERING

- A. Service: Make arrangements with the Utility Company for obtaining a complete service. Pay charges and provide labor and material for the service.
- B. Fees: Contact the Utility Company to determine if any fees, charges or costs will be due the Company, as required for temporary power, permanent power, installations, hook-ups, etc. This fee, charge or cost shall be included in the bid price.
- C. Payment: Pay for required licenses, fees and inspections. Include costs in the proposed construction cost submission. These costs shall include but not be limited to applicable taxes, permits, necessary notices, certificates and costs required to obtain same.

2.10 TEMPORARY LIGHT AND POWER

- A. Capacity: Provide capacity from new temporary service. Make arrangements with the Owner for temporary service and pay all related expenses. Temporary light and power shall be provided constantly during the project dependent upon Owner's safety requirements.
- B. Lighting: Temporary light shall be based on one 200 watt lamp covering each 1,000 square foot of floor area in the building. Each room 100 square foot and over shall have a minimum of one 100-watt lamp with guards. Provisions are to be made for electric welders, if required.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- A. General: The installation of materials and equipment shall be performed in a neat, workmanlike and timely manner by an adequate number of craftsmen knowledgeable of the requirements of the Contract Documents. They shall be skilled in the methods and craftsmanship needed to produce a quality level of workmanship. Personnel who install materials and equipment shall be qualified by training and experience to perform their assigned tasks.

- B. **Acceptable Workmanship:** Acceptable workmanship is characterized by first-quality appearance and function, conforming to applicable standards of building system construction, and exhibiting a high degree of quality and proficiency which is judged by the Architect as equivalent or better than that ordinarily produced by qualified industry tradesmen.
- C. **Performance:** Personnel shall not be used in the performance of the installation of material and equipment who, in the opinion of the Architect, are deemed to be careless or unqualified to perform the assigned tasks. Material and equipment installations not in compliance with the Contract Documents, or installed with substandard workmanship and not acceptable to the Architect, shall be removed and reinstalled by qualified craftsmen, at no change in the contract price.

3.2 PROTECTION AND CLEAN UP

- A. **Protection and Restoration:** Suitably protect equipment provided under this Division during construction. Restore damaged surfaces and items to "like new" condition before a request for substantial completion inspection.
- B. **Handling:** Materials shall be properly protected and Raceway openings shall be temporarily closed by the Contractor to prevent obstruction and damage. Post notice prohibiting the use of systems provided under this Contract, prior to completion of work and acceptance of systems by the Owner's representative. The Contractor shall take precautions to protect his materials from damage and theft.
- C. **Safeguards:** The Contractor shall furnish, place and maintain proper safety guards for the prevention of accidents that might be caused by the workmanship, materials, equipment or systems provided under this contract.
- D. **Cleanup:** Keep the job site free from debris and rubbish. Remove debris and rubbish from the site and leave premises in clean condition on a daily basis.

3.3 SYSTEMS GUARANTEE

- A. **General:** Provide a one-year guarantee. This guarantee shall be by the Contractor to the Owner for any defective workmanship or material, which has been provided under this Contract at no cost to the Owner for a period of one year from the date of substantial completion of the System.

3.4 SPECIAL CONSIDERATIONS

- A. Comply with special requirements imposed at site by Owner. This may include badging of employees, prohibition of smoking, special working hours, or special working conditions.

END OF SECTION 26 00 10

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Copper building wire rated 600 V or less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cerro Wire LLC.
 - 2. Encore Wire Corporation.
 - 3. General Cable Technologies Corporation.
 - 4. Okonite Company (The).
 - 5. Southwire Company.
- C. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

2. RoHS compliant.
 3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- E. Conductor Insulation:
1. Type THHN and Type THWN-2: Comply with UL 83.

2.2 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C. VFD Output Circuits: Stranded for all sizes.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN/THWN-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions: Type THHN/THWN-2, single conductors in raceway.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- E. Exposed Branch Circuits: Type THHN/THWN-2, single conductors in raceway.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.

- G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- H. VFD Output Circuits: Type TC-ER cable with braided shield.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 26 05 29 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 26 05 53 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 07 84 13 "Penetration Firestopping."

3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 2. Perform each of the following visual and electrical tests:
 - a. Inspect exposed sections of conductor and cable for physical damage.
 - b. Inspect compression-applied connectors for correct cable match and indentation.
 - c. Inspect for correct identification.
 - d. Inspect cable jacket and condition.
 - e. Insulation-resistance test on each conductor for ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.
 - f. Continuity test on each conductor and cable.
 - g. Uniform resistance of parallel conductors.
- B. Cables will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements.
 - 3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

END OF SECTION 26 05 19

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes grounding and bonding systems and equipment, plus the following special applications:
 - 1. Ground bonding common with lightning protection system.
 - 2. Foundation steel electrodes.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data:
 - 1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
 - a. Plans showing as-built, dimensioned locations of grounding features, including the following:
 - 1) Test wells.
 - 2) Ground rods.
 - 3) Ground rings.
 - 4) Grounding arrangements and connections for separately derived systems.
 - b. Instructions for periodic testing and inspection of grounding features at test wells.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Advanced Lightning Technology, Ltd.
 - 2. Burndy; Part of Hubbell Electrical Systems.
 - 3. Dossert; AFL Telecommunications LLC.
 - 4. ERICO International Corporation.
 - 5. Fushi Copperweld Inc.
 - 6. Galvan Industries, Inc.; Electrical Products Division, LLC.
 - 7. Harger Lightning & Grounding.
 - 8. ILSCO.
 - 9. O-Z/Gedney; a brand of Emerson Industrial Automation.
 - 10. Robbins Lightning, Inc.
 - 11. SIEMENS Industry, Inc.; Energy Management Division.
 - 12. Thomas & Betts Corporation; A Member of the ABB Group.

2.3 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
 - 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper. See details on drawings.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- C. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
- D. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.
- E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- F. Cable Tray Ground Clamp: Mechanical type, zinc-plated malleable iron.
- G. Conduit Hubs: Mechanical type, terminal with threaded hub.
- H. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.
- I. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.
- J. Water Pipe Clamps: U-bolt type with malleable-iron clamp and copper ground connector rated for direct burial].

2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet.
- B. Ground Plates: 1/4 inch thick, hot-dip galvanized.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 4/0 AWG minimum. Bury at least 24 inches below grade.
- C. Grounding Bus: Install in electrical and communications equipment rooms, as indicated.
- D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.
- B. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.4 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.
- C. Metallic Fences: Comply with requirements of IEEE C2.
 1. Grounding Conductor: Bare, tinned copper, not less than No. 8 AWG.
 2. Gates: Shall be bonded to the grounding conductor with a flexible bonding jumper.
 3. Barbed Wire: Strands shall be bonded to the grounding conductor.

3.5 FENCE GROUNDING

- A. Fence Grounding: Install at maximum intervals of 750 feet.
 - a. Gates and Other Fence Openings: Ground fence on each side of opening.
 - 1) Bond metal gates to gate posts.

- 2) Bond across openings, with and without gates, except at openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.
- B. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
- C. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
- D. Bonding to Lightning-Protection System: If fence terminates at lightning-protected building or structure, ground the fence and bond the fence grounding conductor to lightning-protection down conductor or lightning-protection grounding conductor, complying with NFPA 780.

3.6 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
- C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 2. Use exothermic welds for all below-grade connections.
 3. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- D. Test Wells: Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
- E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

F. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

G. Ground Ring: Install a grounding conductor extending around the perimeter of building.

H. Concrete-Encased Grounding Electrode (Ufer Ground): Fabricate according to NFPA 70; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.

I. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include

observations of weather and other phenomena that may affect test results.
Describe measures taken to improve test results.

- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 26 05 26

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Steel slotted support systems.
 - 2. Aluminum slotted support systems.
 - 3. Conduit and cable support devices.
 - 4. Structural steel for fabricated supports and restraints.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rated capacities and furnished specialties and accessories.
- B. Shop Drawings: Signed and sealed by a qualified professional engineer. For fabrication and installation details for electrical hangers and support systems.
 - 1. Hangers. Include product data for components.
 - 2. Slotted support systems.
 - 3. Equipment supports.
 - 4. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
- C. Delegated-Design Submittal: For hangers and supports for electrical systems.
 - 1. Include design calculations and details of hangers.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design hanger and support system.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
- B. Aluminum Slotted Support Systems: Extruded-aluminum channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
- C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 05 50 00 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
 - 1. NECA 1.
 - 2. NECA 101
 - 3. NECA 102.
 - 4. NECA 105.
 - 5. NECA 111.
- B. Comply with requirements in Section 07 84 13 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.
- C. Comply with requirements for raceways and boxes specified in Section 26 05 33 "Raceways and Boxes for Electrical Systems."
- D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

- E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
- F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

3.3 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Anchor equipment to concrete base.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 05 29

SECTION 26 05 33 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Metal conduits and fittings.
2. Non-Metallic conduits and fittings.
3. Metal wireways and auxiliary gutters.
4. Boxes, enclosures, and cabinets.
5. Handholes and boxes for exterior underground cabling.

- B. Related Requirements:

1. Section 07 84 13 "Penetration Firestopping" for firestopping at conduit and box entrances.

1.3 ACTION SUBMITTALS

- A. Product Data: For all products

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

- A. Metal Conduit:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. GRC: Comply with ANSI C80.1 and UL 6.
3. PVC-Coated Steel Conduit:
 - a. Comply with NEMA RN 1.
 - b. Coating Thickness: 0.040 inch, minimum.
4. EMT: Comply with ANSI C80.3 and UL 797.
5. FMC: Comply with UL 1.

6. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings:

1. Comply with NEMA FB 1 and UL 514B.
2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fittings, General: Listed and labeled for type of conduit, location, and use.
4. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
5. Fittings for EMT: Steel or die cast. Setscrew or compression.
6. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
7. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

- C. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:

1. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

B. Nonmetallic Fittings:

1. Fittings, General: Listed and labeled for type of conduit, location, and use.
2. Fittings for ENT: Comply with NEMA TC 3; match to conduit or tubing type and material.
3. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 or Type 3R unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- B. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

- C. Wireway Covers: Screw-cover type unless otherwise indicated.
- D. Finish: Manufacturer's standard enamel finish.

2.4 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, Type FD, with gasketed cover.
- D. Metal Floor Boxes:
 - 1. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- F. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, with gasketed cover.
- G. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- H. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- I. Cabinets:
 - 1. NEMA 250, Type 1 or Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.
 - 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.5 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
 - 1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
 - 2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
 - 1. Standard: Comply with SCTE 77.
 - 2. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
 - 3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
 - 4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 - 5. Cover Legend: Molded lettering, "Electric" or "Communications".
 - 6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed Conduit: GRC.
 - 2. Concealed Conduit, Aboveground: GRC.
 - 3. Underground Conduit: RNC, Type EPC-40-PVC.
 - 4. Connection to Vibrating Equipment: LFMC.
 - 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 - 3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
 - a. Loading area.
 - b. BOH Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 5. Connection to Vibrating Equipment: FMC, except use LFMC in damp or wet locations.
 - 6. Damp or Wet Locations: GRC.
 - 7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.

3.2 INSTALLATION

- A. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for hangers and supports.
- B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.
- D. Do not fasten conduits onto the bottom side of a metal deck roof.
- E. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- F. Complete raceway installation before starting conductor installation.
- G. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- H. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- I. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.
- J. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- K. Support conduit within 12 inches of enclosures to which attached.
- L. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Arrange raceways to keep a minimum of 1 inch of concrete cover in all directions.
 - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
 - 5. Change from RNC to GRC before rising above floor.
- M. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

- N. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- O. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- P. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- Q. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- R. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- S. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- T. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- U. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- V. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Conduit extending from interior to exterior of building.
 - 4. Conduit extending into pressurized duct and equipment.
 - 5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
 - 6. Where otherwise required by NFPA 70.
- W. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- X. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

- Y. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- Z. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- AA. Locate boxes so that cover or plate will not span different building finishes.
- BB. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- CC. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- DD. Set metal floor boxes level and flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 31 20 00 "Earth Moving" for pipe less than 6 inches in nominal diameter.
2. Install backfill as specified in Section 31 20 00 "Earth Moving."
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 31 20 00 "Earth Moving."
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
 - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
6. Underground Warning Tape: Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.
- D. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 07 84 13 "Penetration Firestopping."

3.6 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 26 05 33

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Color and legend requirements for raceways, conductors, and warning labels and signs.
 - 2. Labels.
 - 3. Tapes and stencils.
 - 4. Signs.
 - 5. Paint for identification.
 - 6. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Comply with NFPA 70E and Section 26 05 74 for arc-flash warning labels.
- F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

2.2 COLOR AND LEGEND REQUIREMENTS

- A. Raceways and Cables Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- B. Color-Coding for Phase Identification, 600 V or Less: Use colors listed below for ungrounded conductors.
 - 1. Colors for 208/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - 2. Colors for 480/277-V Circuits:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.
 - 3. Color for Neutral: White or gray.
 - 4. Color for Equipment Grounds: Bare copper, Green or Green with a yellow stripe.
 - 5. Colors for Isolated Grounds: Green with white stripe.
- C. Raceways and Cables Carrying Circuits at More Than 600 V:
 - 1. Black letters on an orange field.
 - 2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."
- D. Warning Label Colors:
 - 1. Identify system voltage with black letters on an orange background.
- E. Warning labels and signs shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."
- F. Equipment Identification Labels:
 - 1. Black letters on a white field.

2.3 LABELS

- A. Self-Adhesive Labels: Thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. Minimum Nominal Size:
 - a. 1-1/2 by 6 inches for raceway and conductors.
 - b. 3-1/2 by 5 inches for equipment.
- B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- C. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.
- D. Tape and Stencil: 4-inch-wide black stripes on 10-inch centers placed diagonally over orange background and are 12 inches wide. Stop stripes at legends.
- E. Floor Marking Tape: 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.
- F. Underground-Line Warning Tape:
 1. Tape:
 - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
 2. Color and Printing:
 - a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
 - b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE" .
 - c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".

2.4 SIGNS

- A. Laminated Acrylic or Melamine Plastic Signs:
 1. Engraved legend.
 2. Thickness:
 - a. For signs up to 20 sq. in., minimum 1/16 inch thick.
 - b. For signs larger than 20 sq. in., 1/8 inch thick.
 - c. Engraved legend with black letters on white face.

2.5 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.
- G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.
 - 1. Secure tight to surface of conductor, cable, or raceway.
- H. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.
 - 1. Secure tight to surface of conductor, cable, or raceway.

- I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
- J. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions.
- K. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.
- L. Accessible Fittings for Raceways: Identify the covers of each junction and pull box of the following systems with the wiring system legend and system voltage. System legends shall be as follows:
 - 1. "EMERGENCY POWER."
 - 2. "POWER."
 - 3. "UPS."
- M. Self-Adhesive Labels:
 - 1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
 - 2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
- N. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.
- O. Heat-Shrink, Preprinted Tubes: Secure tight to surface at a location with high visibility and accessibility.
- P. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.
- Q. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.
 - 1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.
- R. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.
- S. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's written instructions.
- T. Underground Line Warning Tape:
 - 1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade.

- U. Laminated Acrylic or Melamine Plastic Signs:
 - 1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
 - 2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high sign; where two lines of text are required, use labels 2 inches high.

3.3 IDENTIFICATION SCHEDULE

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.
- C. Raceways: Identify with self-adhesive raceway labels. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- D. Conductors: For conductors in vaults, pull and junction boxes, manholes, and handholes, use self-adhesive labels to identify the phase.
- E. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
- F. Workspace Indication: Apply floor marking tape to finished surfaces. Show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- G. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.
- H. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels
- I. Arc Flash Warning Labeling: Self-adhesive labels.
- J. Operating Instruction Signs: Self-adhesive labels
- K. Emergency Operating Instruction Signs: Laminated acrylic or melamine plastic signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions.
- L. Equipment Identification Labels:
 - 1. Indoor Equipment: Laminated acrylic or melamine plastic sign.
 - 2. Outdoor Equipment: Laminated acrylic or melamine sign.
 - 3. Equipment to Be Labeled: All equipment.

END OF SECTION 26 05 53

SECTION 26 09 23 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Photocells
 - 2. Indoor occupancy and vacancy sensors.
 - 3. Switchbox-mounted occupancy sensors.
 - 4. Outdoor motion sensors.
 - 5. Lighting relays

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Show installation details for the following:
 - a. Occupancy sensors.
 - b. Vacancy sensors.
 - 2. Interconnection diagrams showing field-installed wiring.
 - 3. Include diagrams for power, signal, and control wiring.
- C. Field quality-control reports.
- D. Sample Warranty: For manufacturer's warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data

1.5 WARRANTY

- A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.

- 1. Warranty Period: Two year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PHOTOCELLS

- A. Manufacturers: See cut-sheets at end of this Section.

2.2 INDOOR OCCUPANCY AND VACANCY SENSORS

- A. Manufacturers: See cut-sheets at end of this Section.

2.3 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

- A. Manufacturers: See cut-sheets at end of this Section.

2.4 OUTDOOR MOTION SENSORS

- A. Manufacturers: See cut-sheets at end of this Section.

2.5 LIGHTING RELAYS

- A. Manufacturers: See cut-sheets at end of this Section.

2.6 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."
- B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."
- C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 14 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.
- B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SENSOR INSTALLATION

- A. Comply with NECA 1.
- B. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- C. Install and aim sensors in locations to achieve not less than 90-percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.3 WIRING INSTALLATION

- A. Comply with NECA 1.
- B. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- C. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.4 IDENTIFICATION

- A. Identify components and power and control wiring according to Section 26 05 53 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Lighting control devices will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.7 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

3.8 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION 26 09 23

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Distribution panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of panelboard.
 - 1. Include materials, switching and overcurrent protective devices, accessories, and components indicated.
 - 2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details.
 - 2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
 - 3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
 - 4. Detail bus configuration, current, and voltage ratings.
 - 5. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 6. Include evidence of NRTL listing for series rating of installed devices.
 - 7. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - 8. Include wiring diagrams for power, signal, and control wiring.
 - 9. Key interlock scheme drawing and sequence of operations.
 - 10. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device. Include an Internet link for electronic access to downloadable PDF of the coordination curves.

1.4 INFORMATIONAL SUBMITTALS

- A. Test Reports.
- B. Schedules: Submit final versions with O&M.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: ISO 9001 or 9002 certified.

1.7 FIELD CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 - 2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding 104 deg F.
 - b. Altitude: Not exceeding 6600 feet.

1.8 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.
 - 1. Panelboard Warranty Period: 18 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS COMMON REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.

D. Enclosures: Dead-front cabinets.

1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Outdoor Locations: NEMA 250, Type 3R.
 - c. Kitchen and Wash-Down Areas: NEMA 250, Type 4X, stainless steel.
 - d. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
 - e. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.
2. Height: 84 inches maximum.
3. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.
4. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.
5. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
6. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
7. Finishes:
 - a. Panels and Trim: Galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Galvanized steel.
 - c. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components.

E. Phase, Neutral, and Ground Buses:

1. Material: Tin-plated aluminum.
 - a. Plating shall run entire length of bus.
 - b. Bus shall be fully rated the entire length.
2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
4. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.
5. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and listed and labeled by an NRTL acceptable to authority having jurisdiction, as suitable for nonlinear loads in electronic-grade panelboards and others designated on Drawings. Connectors shall be sized for double-sized or parallel conductors as indicated on Drawings. Do not mount neutral bus in gutter.

F. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Tin-plated aluminum.
 2. Terminations shall allow use of 75 deg C rated conductors without derating.
 3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
 4. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.
 5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.
 6. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
 7. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
 8. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.
- G. NRTL Label: Panelboards or load centers shall be labeled by an NRTL acceptable to authority having jurisdiction for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards or load centers shall have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.
- H. Future Devices: Panelboards or load centers shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- I. Panelboard Short-Circuit Current Rating: Rated for series-connected system with integral or remote upstream overcurrent protective devices and labeled by an NRTL. Include label or manual with size and type of allowable upstream and branch devices listed and labeled by an NRTL for series-connected short-circuit rating.
1. Panelboards rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
 2. Panelboards rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.
- J. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.
1. Panelboards and overcurrent protective devices rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
 2. Panelboards and overcurrent protective devices rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

2.2 DISTRIBUTION PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. SIEMENS Industry, Inc.; Energy Management Division.

- 2. Square D; by Schneider Electric.
- B. Panelboards: NEMA PB 1, distribution type.
- C. Doors: None
- D. Mains: As specified.
- E. Branch Overcurrent Protective Devices: Bolt-on circuit breakers

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. SIEMENS Industry, Inc.; Energy Management Division.
 - 2. Square D; by Schneider Electric.
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- D. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. MCCB: Comply with UL 489, with fully rated interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers:
 - a. Inverse time-current element for low-level overloads.
 - b. Instantaneous magnetic trip element for short circuits.
 - c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - 2. Electronic Trip Circuit Breakers (600A and larger):
 - a. RMS sensing.
 - b. Field-replaceable rating plug or electronic trip.
 - c. Digital display of settings, trip targets, and indicated metering displays.
 - d. Ten-event, trip-history log. Each trip event shall be recorded with type, phase, and magnitude of fault that caused the trip.
 - e. Field-Adjustable Settings.
 - 3. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).
 - 4. GFEP Circuit Breakers: Class B ground-fault protection (30-mA trip).
 - 5. Arc-Fault Circuit Interrupter Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.

6. MCCB Features and Accessories:

- a. Standard frame sizes, trip ratings, and number of poles.
- b. Breaker handle indicates tripped status.
- c. UL listed for reverse connection without restrictive line or load ratings.
- d. Lugs: Suitable for number, size, trip ratings, and conductor materials.
- e. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and HID lighting circuits.
- f. Shunt Trip (when indicated): 120-V trip coil energized from separate circuit.

2.5 IDENTIFICATION

- A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.
- B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.
- C. Circuit Directory: Computer-generated circuit directory mounted inside panelboard door with transparent plastic protective cover.
 - 1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.
- B. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.
- C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance

requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

- B. Comply with NECA 1.
- C. Mount panelboard cabinet plumb and rigid without distortion of box.
- D. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- E. Mount surface-mounted panelboards to steel slotted supports 5/8 inch in depth. Orient steel slotted supports vertically.

3.3 IDENTIFICATION

- A. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."
- B. Device Nameplates: Label each branch circuit device in power panelboards with a nameplate complying with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."
- C. Install warning and arc-flash signs complying with requirements in Section 26 05 53 "Identification for Electrical Systems".

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection stated in NETA ATS. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Panelboards will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results, with comparisons of the two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.
- B. Set field-adjustable circuit-breaker trip ranges.
- C. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes. Prior to making circuit changes to achieve load balancing, inform Architect of effect on phase color coding.
 - 1. Measure loads during period of normal facility operations.
 - 2. Perform circuit changes to achieve load balancing outside normal facility operation schedule or at times directed by the Architect. Avoid disrupting services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
 - 3. After changing circuits to achieve load balancing, recheck loads during normal facility operations. Record load readings before and after changing circuits to achieve load balancing.
 - 4. Tolerance: Maximum difference between phase loads, within a panelboard, shall not exceed 20 percent.

END OF SECTION 26 24 16

SECTION 26 41 13 - LIGHTNING PROTECTION FOR STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes lightning protection system for ordinary structures.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Include layouts of the lightning protection system, with details of the components to be used in the installation.
 - 2. Include raceway locations needed for the installation of conductors.
 - 3. Details of air terminals, ground rods, ground rings, conductor supports, splices, and terminations, including concealment requirements.
 - 4. Include roof attachment details, coordinated with roof installation.
 - 5. Calculations required by NFPA 780 for bonding of metal bodies.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of roof adhesive for attaching the roof-mounted air terminal assemblies, approved by the roofing-material manufacturer.
- C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For lightning protection system to include in maintenance manuals.
 - 1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:

- a. Dimensioned site plan showing dimensioned route of the ground loop conductor and the ground rod locations. Comply with requirements of Section 01 78 39 "Project Record Documents."
- b. A system testing and inspection record, listing the results of inspections and ground resistance tests, as recommended by NFPA 780, Annex D.

B. Completion Certificate: UL Master Label Certificate.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: UL-listed installer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1. Advanced Lightning Technology, Ltd.
- 2. East Coast Lightning Equipment Inc.
- 3. ERICO International Corporation.
- 4. Harger Lightning & Grounding.
- 5. Heary Bros. Lightning Protection Co. Inc.
- 6. Independent Protection Co.
- 7. National Lightning Protection.
- 8. Preferred Lightning Protection.
- 9. Robbins Lightning, Inc.
- 10. Thompson Lightning Protection, Inc.

2.2 PERFORMANCE REQUIREMENTS

- A. UL Lightning Protection Standard: Comply with UL 96A requirements for Class I buildings.
- B. Lightning Protection Components, Devices, and Accessories: Listed and labeled by a qualified testing agency as complying with UL 96, and marked for intended location and application.

2.3 MATERIALS

A. Air Terminals:

- 1. Copper unless otherwise indicated.
- 2. 3/8-inch diameter by 18 inches long.
- 3. Rounded tip.

B. Class 1 Main Conductors:

1. Copper: 57,400 circular mils in diameter.
- C. Secondary Conductors:
 1. Stranded Copper: 26,240 circular mils in diameter.
- D. Ground Loop Conductor: Stranded copper.
- E. Ground Rods:
 1. Material: Copper-clad steel.
 2. Diameter: 5/8 inch.
 3. Rods shall be not less than 120 inches long.
 4. Sectional type, with integral threads.
- F. Conductor Splices and Connectors: Compression fittings that are installed with hydraulically operated tools, or exothermic welds, approved for use with the class type.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install lightning protection components and systems according to UL 96A.
- B. Install conductors with direct paths from air terminals to ground connections. Avoid bends less than 90 degrees and 8 inches in radius and narrow loops.
- C. Conceal conductors within normal view from exterior locations at grade within 200 feet of building. Comply with requirements for concealed installations in UL 96A.
 1. Roof penetrations required for down conductors and connections to structural-steel framework shall be made using listed through-roof fitting and connector assemblies with solid rods and appropriate roof flashings. Use materials approved by the roofing manufacturer for the purpose. Conform to the methods and materials required at roofing penetrations of the lightning protection components to ensure compatibility with the roofing specifications and warranty.
 2. Install conduit where necessary to comply with conductor concealment requirements.
 3. Air Terminals on Single-Ply Membrane Roofing: Comply with adhesive manufacturer's written instructions.
- D. Ground Ring Electrode: The conductor shall be not less than the main-size lightning conductor.

3.2 CONNECTIONS

- A. Aboveground concealed connections, and connections in earth or concrete, shall be done by exothermic welds or by high-compression fittings listed for the purpose.

- B. Aboveground exposed connections shall be done using the following types of connectors, listed and labeled for the purpose: exothermic weld, high compression or crimp.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

3.3 CORROSION PROTECTION

- A. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials.
- B. Use conductors with protective coatings where conditions would cause deterioration or corrosion of conductors.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
 - 1. Perform inspections as required to obtain a UL Master Label for system.
- B. Prepare test and inspection reports and certificates.

END OF SECTION 26 41 13

SECTION 26 51 19 - LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Manuals.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.6 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: Five year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- B. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

- 1. Label shall include the following lamp characteristics:

- a. "USE ONLY" and include specific lamp type.
 - b. Lamp diameter, shape, size, wattage, and coating.
 - c. CCT and CRI.

- C. Recessed luminaires shall comply with NEMA LE 4.

2.2 FIXTURE SCHEDULE

- A. Manufacturers: See schedule on drawings and product cut-sheets at the end of this Section.

2.3 MATERIALS

- A. Metal Parts:

- 1. Free of burrs and sharp corners and edges.
 - 2. Sheet metal components shall be steel unless otherwise indicated.
 - 3. Form and support to prevent warping and sagging.

- B. Steel:

- 1. ASTM A 36/A 36M for carbon structural steel.
 - 2. ASTM A 568/A 568M for sheet steel.

- C. Stainless Steel:

- 1. 1. Manufacturer's standard grade.
 - 2. 2. Manufacturer's standard type, ASTM A 240/240 M.

- D. Galvanized Steel: ASTM A 653/A 653M.

- E. Aluminum: ASTM B 209.

2.4 METAL FINISHES

- A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.5 LUMINAIRE SUPPORT

- A. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.
- C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage.
- D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

- A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is sufficiently complete, clean luminaires used for temporary lighting and install new lamps.

3.3 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire.
- D. Supports:
 - 1. Sized and rated for luminaire weight.
 - 2. Able to maintain luminaire position after cleaning and relamping.
 - 3. Provide support for luminaire without causing deflection of ceiling or wall.

4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

E. Flush-Mounted Luminaires:

1. Secured to outlet box.
2. Attached to ceiling structural members at four points equally spaced around circumference of luminaire.
3. Trim ring flush with finished surface.

F. Wall-Mounted Luminaires:

1. Attached to structural members in walls
2. Do not attach luminaires directly to gypsum board.

G. Suspended Luminaires:

1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
3. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.

H. Ceiling-Grid-Mounted Luminaires:

1. Secure to any required outlet box.
2. Secure luminaire to the luminaire opening using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
3. Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.

- I. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.
- B. Luminaire will be considered defective if it does not pass operation tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 26 51 19

SECTION 28 05 13 - CONDUCTORS AND CABLES FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fire alarm wire and cable.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 FIRE ALARM WIRE AND CABLE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Allied Wire & Cable Inc.
 - 2. CommScope, Inc.
 - 3. Comtran Corporation.
 - 4. Draka Cableteq USA; a Prysmian Group company.
 - 5. Genesis Cable Products; Honeywell International, Inc.
 - 6. Radix Wire.
 - 7. Rockbestos-Suprenant Cable Corp.
 - 8. Superior Essex Inc.
 - 9. West Penn Wire.
- B. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.
- C. Signaling Line Circuits: Twisted, shielded pair, not less than No. 16 AWG.
- D. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation, and complying with requirements in UL 2196 for a two-hour rating.

1. Low-Voltage Circuits: No. 16 AWG, minimum, in pathway.
2. Line-Voltage Circuits: No. 12 AWG, minimum, in pathway.

PART 3 - EXECUTION

3.1 WIRING METHOD

- A. Install all wiring in conduit.
 1. Minimum conduit size shall be 3/4 inch.

3.2 FIRE ALARM WIRING INSTALLATION

- A. Comply with NECA 1 and NFPA 72.

3.3 POWER AND CONTROL-CIRCUIT CONDUCTORS

- A. 120-V Power Wiring: Install according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables" unless otherwise indicated.
- B. Minimum Conductor Sizes:
 1. Class 1 remote-control and signal circuits, No. 14 AWG.
 2. Class 2 low-energy, remote-control and signal circuits, No. 16 AWG.
 3. Class 3 low-energy, remote-control, alarm and signal circuits, No. 12 AWG.

3.4 CONNECTIONS

- A. Comply with requirements in Section 28 31 11 "Digital, Addressable Fire-Alarm System" for connecting, terminating, and identifying wires and cables.

3.5 FIRESTOPPING

- A. Comply with requirements in Section 07 84 13 "Penetration Firestopping."

END OF SECTION 28 05 13

SECTION 28 46 21 - ADDRESSABLE FIRE-ALARM SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Fire-alarm control unit.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Heat detectors.
5. Notification appliances.
6. Device guards.
7. Firefighters' two-way telephone communication service.
8. Magnetic door holders.
9. Remote annunciator.
10. Addressable interface device.
11. Digital alarm communicator transmitter.
12. Network communications.

- B. Related Requirements:

1. Section 280513 "Conductors and Cables for Electronics Safety and Security" for cables and conductors for fire-alarm systems.

1.3 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. FACP: Fire Alarm Control Panel.
- C. HLI: High Level Interface.
- D. NICET: National Institute for Certification in Engineering Technologies.
- E. PC: Personal computer.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.

1. Include construction details, material descriptions, dimensions, profiles, and finishes.
2. Include rated capacities, operating characteristics, and electrical characteristics.

B. Shop Drawings: For fire-alarm system.

1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
2. Include plans, elevations, sections, details, and attachments to other work.
3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
4. Detail assembly and support requirements.
5. Include voltage drop calculations for notification-appliance circuits.
6. Include battery-size calculations.
7. Include input/output matrix.
8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
9. Include performance parameters and installation details for each detector.
10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
11. Provide program report showing that air-sampling detector pipe layout balances pneumatically within the airflow range of the air-sampling detector.
12. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.
 - a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
 - b. Show field wiring required for HVAC unit shutdown on alarm.
 - c. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' control system.
 - d. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' smoke-evacuation system.
 - e. Locate detectors according to manufacturer's written recommendations.
 - f. Show air-sampling detector pipe routing.
13. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram.
14. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

C. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. Trained and certified by manufacturer in fire-alarm system design.
 - b. NICET-certified, fire-alarm technician; **Level III** minimum.
 - c. Licensed or certified by authorities having jurisdiction.

- D. Delegated-Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.
 - 2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
 - 3. Indicate audible appliances required to produce square wave signal per NFPA 72.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.

1.6 Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
 - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following **and deliver copies to authorities having jurisdiction:**
 - a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
 - d. Riser diagram.
 - e. Device addresses.
 - f. Record copy of site-specific software.
 - g. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
 - 1) Equipment tested.
 - 2) Frequency of testing of installed components.
 - 3) Frequency of inspection of installed components.
 - 4) Requirements and recommendations related to results of maintenance.
 - 5) Manufacturer's user training manuals.

- h. Manufacturer's required maintenance related to system warranty requirements.
- i. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:

- 1. Software operating and upgrade manuals.
- 2. Program Software Backup: On magnetic media or compact disk, complete with data files.
- 3. Device address list.
- 4. Printout of software application and graphic screens.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

- 1. Lamps for Remote Indicating Lamp Units: Quantity equal to **10** percent of amount installed, but no fewer than one unit.
- 2. Lamps for Strobe Units: Quantity equal to **10** percent of amount installed, but no fewer than one unit.
- 3. Smoke Detectors, Fire Detectors: Quantity equal to **10** percent of amount of each type installed, but no fewer than one unit of each type.
- 4. Detector Bases: Quantity equal to **two** percent of amount of each type installed, but no fewer than one unit of each type.
- 5. Keys and Tools: One extra set for access to locked or tamperproofed components.
- 6. Audible and Visual Notification Appliances: **Two** of each type installed.
- 7. Fuses: **Two** of each type installed in the system. Provide in a box or cabinet with compartments marked with fuse types and sizes.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
- B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm **Level III** technician.
- C. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
 - 2. Warranty Period: **Five** years from date of manufacture.

- B. Warranties specified in Division 01 Specification Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.
- B. Noncoded, UL-certified addressable system, with multiplexed signal transmission and **horn**/strobe evacuation.
- C. Automatic sensitivity control of certain smoke detectors.
- D. All components provided shall be listed for use with the selected system.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices **and systems**:
 - 1. Manual stations.
 - 2. Heat detectors.
 - 3. Smoke detectors.
 - 4. Duct smoke detectors.
 - 5. Carbon monoxide detectors.
 - 6. Automatic sprinkler system water flow.
 - 7. Fire-extinguishing system operation.
 - 8. Dry system pressure flow switch.
- B. Fire-alarm signal shall initiate the following actions:
 - 1. Continuously operate alarm notification appliances.
 - 2. Identify alarm and specific initiating device at fire-alarm control unit, **and remote annunciators**.
 - 3. Transmit an alarm signal to the remote alarm receiving station.
 - 4. Unlock electric door locks in designated egress paths.
 - 5. Release fire and smoke doors held open by magnetic door holders.
 - 6. Activate voice/alarm communication system.
 - 7. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
 - 8. Activate stairwell and elevator-shaft pressurization systems.
 - 9. Recall elevators to primary or alternate recall floors.

10. Activate elevator power shunt trip.
11. Activate emergency lighting control.
12. Activate emergency shutoffs for gas and fuel supplies.
13. Record events in the system memory.
14. Indicate device in alarm on the graphic annunciator.

C. Supervisory signal initiation shall be by one or more of the following devices and actions:

1. Valve supervisory switch.
2. Elevator shunt-trip supervision.
3. Independent fire-detection and -suppression systems.
4. User disabling of zones or individual devices.

D. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.
2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3. Loss of communication with any addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
4. Loss of primary power at fire-alarm control unit.
5. Ground or a single break in internal circuits of fire-alarm control unit.
6. Abnormal ac voltage at fire-alarm control unit.
7. Break in standby battery circuitry.
8. Failure of battery charging.
9. Abnormal position of any switch at fire-alarm control unit or annunciator.
10. Voice signal amplifier failure.
11. Hose cabinet door open.

E. System Supervisory Signal Actions:

1. Initiate notification appliances.
2. Identify specific device initiating the event at fire-alarm control unit **and remote annunciators.**
3. Transmit system status to building management system.
4. Display system status on graphic annunciator.

2.3 FIRE-ALARM CONTROL UNIT

A. Basis-of-Design Product: Subject to compliance with requirements, provide Potter Electric Signal Company, LLC; IPA Series control panel or a comparable product by one of the following:

1. Fire-Lite Alarms, Inc; A Honeywell International Company.
2. Silent Knight.
3. Bosch Security Systems, Inc.
4. Potter Electric Signal Company, LLC

B. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
 - a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
 - b. Include a real-time clock for time annotation of events on the event recorder and printer.
 - c. Provide communication between the FACP and remote circuit interface panels, annunciators, and displays.
 - d. The FACP shall be listed for connection to a central-station signaling system service.
 - e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 4000-event history log.
 2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
 3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.
- C. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and control menu.
1. Annunciator and Display: Liquid-crystal type, **160** characters, minimum.
 2. Keypad: Arranged to permit entry and execution of display, and control commands.
- D. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
1. Annunciator and Display: Liquid-crystal type, **four** lines of **40** characters, minimum.
 2. Keypad: Arranged to permit entry and execution of display, and control commands.
- E. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:
1. Pathway Class Designations: NFPA 72, **Class A**.
 2. Pathway Survivability: **Level 0**.
 3. Serial Interfaces:
 - a. One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
 - b. One Ethernet port for PC configuration.
- F. Smoke-Alarm Verification:
1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.

2. Activate an approved "alarm-verification" sequence at fire-alarm control unit and detector.
3. Record events by the system printer.
4. Sound general alarm if the alarm is verified.
5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

G. Notification-Appliance Circuit:

1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
2. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.
3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.

H. Elevator Recall:

1. Elevator recall shall be initiated only by one of the following alarm-initiating devices:
 - a. Elevator lobby detectors except the lobby detector on the designated floor.
 - b. Smoke detector in elevator machine room.
 - c. Smoke detectors in elevator hoistway.
2. Elevator controller shall be programmed to move the cars to the alternate recall floor if lobby detectors located on the designated recall floors are activated.
3. Water-flow alarm connected to sprinkler in an elevator shaft and elevator machine room shall shut down elevators associated with the location without time delay.
 - a. Water-flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.

I. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke-barrier walls shall **be** connected to fire-alarm system.

J. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory.

K. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.

L. Voice/Alarm Signaling Service: Central emergency communication system

1. Indicate number of alarm channels for automatic, simultaneous transmission of different announcements to different zones or for manual transmission of announcements by use of the central-control microphone. Amplifiers shall comply with UL 1711.

- a. Allow the application of, and evacuation signal to, indicated number of zones and, at the same time, allow voice paging to the other zones selectively or in any combination.
 - b. Programmable tone and message sequence selection.
 - c. Standard digitally recorded messages for "Evacuation" and "All Clear."
 - d. Generate tones to be sequenced with audio messages of type recommended by NFPA 72 and that are compatible with tone patterns of notification-appliance circuits of fire-alarm control unit.
2. Status Annunciator: Indicate the status of various voice/alarm speaker zones and the status of firefighters' two-way telephone communication zones.
- M. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, **supervisory and digital alarm communicator transmitters** shall be powered by 24-V dc source.
 1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
- N. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
 1. Batteries: **Sealed lead calcium.**
- O. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.4 MANUAL FIRE-ALARM BOXES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Potter Electric Signal Company, LLC manual fire-alarm boxes or comparable products by one of the following:
 1. Fire-Lite Alarms, Inc; A Honeywell International Company.
 2. Silent Knight.
 3. Bosch Security Systems, Inc.
 4. Potter Electric Signal Company, LLC.
- B. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be die-cast construction finished in red with operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.
 1. Double-action mechanism requiring two actions to initiate an alarm, **lift-cover, pull-lever** type; with **integral** addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
 2. Station Reset: Key- or wrench-operated switch.

3. Indoor Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.
4. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.

2.5 SYSTEM SMOKE DETECTORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Potter Electric Signal Company, LLC system smoke detectors or comparable products by one of the following:

1. Fire-Lite Alarms, Inc; A Honeywell International Company.
2. Silent Knight.
3. Bosch Security Systems, Inc.
4. Potter Electric Signal Company, LLC.

- B. General Requirements for System Smoke Detectors:

1. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
2. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
3. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
4. Integral Visual-Indicating Light: LED type, indicating detector has operated.
5. Remote Control: Unless otherwise indicated, detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition.
 - a. Rate-of-rise temperature characteristic of combination smoke- and heat-detection units shall be selectable at fire-alarm control unit for 15 deg F (8 deg C) per minute.
 - b. Fixed-temperature sensing characteristic of combination smoke- and heat-detection units shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 deg F (57 deg C).
 - c. Multiple levels of detection sensitivity for each sensor.
 - d. Sensitivity levels based on time of day.

- C. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).

D. Duct Smoke Detectors: Photoelectric type complying with UL 268A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
3. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
4. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.6 CARBON MONOXIDE DETECTORS

A. General: Carbon monoxide detector listed for connection to fire-alarm system.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system.
2. Twist-lock base interchangeable with smoke-detector bases.
3. Testable by introducing test carbon monoxide into the sensing cell.
4. Detector shall send trouble alarm when nearing end-of-life, or internal faults.
5. Comply with UL 2075.
6. Minimum 8-year sensor lifespan.
7. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Sensor run-time and life remaining.

2.7 HEAT DETECTORS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Potter Electric Signal Company, LLC heat detectors or comparable products by one of the following:

1. Fire-Lite Alarms, Inc; A Honeywell International Company.
2. Silent Knight.
3. Bosch Security Systems, Inc.
4. Potter Electric Signal Company, LLC.

B. General Requirements for Heat Detectors: Comply with UL 521.

1. Temperature sensors shall test for and communicate the sensitivity range of the device.
- C. Heat Detector, Combination Type: Actuated by either a fixed temperature of **135 deg F (57 deg C)** or a rate of rise that exceeds **15 deg F (8 deg C)** per minute unless otherwise indicated.
 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
- D. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of **185 deg F (85 deg C)**.
 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
- E. Continuous Linear Heat-Detector System:
 1. Detector Cable: Rated detection temperature **155 deg F (68 deg C)**. Listed for "regular" service and a standard environment. Cable includes two steel actuator wires twisted together with spring pressure, wrapped with protective tape, and finished with PVC outer sheath. Each actuator wire is insulated with heat-sensitive material that reacts with heat to allow the cable twist pressure to short circuit wires at the location of elevated temperature.
 2. Control Unit: Two-zone or multizone unit as indicated. Provide same system power supply, supervision, and alarm features as specified for fire-alarm control unit.
 3. Signals to Fire-Alarm Control Unit: Any type of local system trouble shall be reported to fire-alarm control unit as a composite "trouble" signal. Alarms on each detection zone shall be individually reported to central fire-alarm control unit as separately identified zones.
 4. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.8 NOTIFICATION APPLIANCES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Potter Electric Signal Company, LLC notification appliances or comparable products by one of the following:
 1. Fire-Lite Alarms, Inc; A Honeywell International Company.
 2. Silent Knight.
 3. Bosch Security Systems, Inc.
 4. Potter Electric Signal Company, LLC
- B. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.

- C. Chimes, Low-Level Output: 70-dBA minimum rated output.
- D. Chimes, High-Level Output: 66-dBA minimum rated output.
- E. Horns: Electronic-polarized type, 24-V dc. Comply with UL 464. Horns shall produce a sound-pressure level of 75 dBA, measured **10 feet (3 m)** from the horn, using the coded signal prescribed in UL 464 test protocol.
- F. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear lens mounted on an aluminum faceplate. The word "FIRE" is displayed in minimum **1-inch- (25-mm-)** high letters.
 - 1. Rated Light Output:
 - a. 15/30/75/110 cd, selectable in the field.
 - 2. Mounting: Wall mounted unless otherwise indicated.
 - 3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
 - 4. Flashing shall be in a temporal pattern, synchronized with other units.
 - 5. Strobe Leads: Factory connected to screw terminals.
 - 6. Mounting Faceplate: Factory finished, **red**.
- G. Voice/Tone Notification Appliances:
 - 1. Comply with UL 1480.
 - 2. Speakers for Voice Notification: Locate speakers for voice notification to provide the intelligibility requirements of the "Notification Appliances" and "Emergency Communications Systems" chapters in NFPA 72.
 - 3. High-Range Units: Rated 2 to 15 W.
 - 4. Low-Range Units: Rated 1 to 2 W.
 - 5. Mounting: **surface mounted and bidirectional**.
 - 6. Matching Transformers: Tap range matched to acoustical environment of speaker location.
- H. Exit Marking Audible Notification Appliance:
 - 1. Exit marking audible notification appliances shall meet the audibility requirements in NFPA 72.
 - 2. Provide exit marking audible notification appliances at the entrance to all building exits.
 - 3. Provide exit marking audible notification appliances at the entrance to areas of refuge with audible signals distinct from those used for building exit marking.

2.9 FIREFIGHTERS' TWO-WAY TELEPHONE COMMUNICATION SERVICE

- A. Dedicated, two-way, supervised, telephone voice communication links between fire-alarm control unit and remote firefighters' telephone stations. Supervised telephone lines shall be connected to talk circuits by controls in a control module. Provide the following:
 - 1. Common-talk type for firefighter use only.
 - 2. Selective-talk type for use by firefighters and fire wardens.

3. Audible Pulse and Tone Generator, and High-Intensity Lamp: When a remote telephone is taken off the hook, it causes an audible signal to sound and a high-intensity lamp to flash at the fire command center.
4. Selector panel controls to provide for simultaneous operation of up to five telephones in the same zone. Indicate ground faults and open or shorted telephone lines on the panel front by individual LEDs.
5. Display: LED to indicate location of caller.
6. Remote Telephone Cabinet: Flush- or surface-mounted cabinet as indicated, factory-standard red finish, with handset.
7. Remote Telephone Jack Stations: Single-gang, stainless-steel-plate mounted plug, engraved "Fire Emergency Phone."

2.10 MAGNETIC DOOR HOLDERS

- A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.
 1. Electromagnets: Require no more than 3 W to develop **25-lbf (111-N)** holding force.
 2. Wall-Mounted Units: Flush mounted unless otherwise indicated.
 3. Rating: 24-V ac or dc.
 4. Rating: 120-V ac.
- B. Material and Finish: Match door hardware.

2.11 REMOTE ANNUNCIATOR

- A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.
 1. Mounting: **Flush** cabinet, NEMA 250, Type 1.
- B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

2.12 ADDRESSABLE INTERFACE DEVICE

- A. General:
 1. Include address-setting means on the module.
 2. Store an internal identifying code for control panel use to identify the module type.
- B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.
- C. Integral Relay: Capable of providing a direct signal **to elevator controller to initiate elevator recall.**

1. Allow the control panel to switch the relay contacts on command.
2. Have a minimum of one normally open and one normally closed contacts available for field wiring.

D. Control Module:

1. Operate notification devices.
2. Operate solenoids for use in sprinkler service.

2.13 DIGITAL ALARM COMMUNICATOR TRANSMITTER

- A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632.
- B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture **two** telephone line(s) and dial a preset number for a remote central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.
- C. Local functions and display at the digital alarm communicator transmitter shall include the following:
 1. Verification that both telephone lines are available.
 2. Programming device.
 3. LED display.
 4. Manual test report function and manual transmission clear indication.
 5. Communications failure with the central station or fire-alarm control unit.
- D. Digital data transmission shall include the following:
 1. Address of the alarm-initiating device.
 2. Address of the supervisory signal.
 3. Address of the trouble-initiating device.
 4. Loss of ac supply.
 5. Loss of power.
 6. Low battery.
 7. Abnormal test signal.
 8. Communication bus failure.
- E. Secondary Power: Integral rechargeable battery and automatic charger.
- F. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.14 NETWORK COMMUNICATIONS

- A. Provide network communications for fire-alarm system according to fire-alarm manufacturer's written requirements.
- B. Provide network communications pathway per manufacturer's written requirements and requirements in NFPA 72 and NFPA 70.

2.15 DEVICE GUARDS

- A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.
 - 1. Factory fabricated and furnished by device manufacturer.
 - 2. Finish: Paint of color to match the protected device.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
 - 1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.
- B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
 - 1. Devices placed in service before all other trades have completed cleanup shall be replaced.
 - 2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.
- B. Install wall-mounted equipment, with tops of cabinets not more than 78 inches (1980 mm) above the finished floor.

1. Comply with requirements for seismic-restraint devices specified in Section 270548.16 "Seismic Controls for Communications Systems."
- C. Manual Fire-Alarm Boxes:
1. Install manual fire-alarm box in the normal path of egress within **60 inches (1520 mm)** of the exit doorway.
 2. Mount manual fire-alarm box on a background of a contrasting color.
 3. The operable part of manual fire-alarm box shall be between **42 inches (1060 mm)** and **48 inches (1220 mm)** above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- D. Smoke- or Heat-Detector Spacing:
1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
 2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
 3. Smooth ceiling spacing shall not exceed **30 feet (9 m)**.
 4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A [**or Annex B**] in NFPA 72.
 5. HVAC: Locate detectors not closer than **60 inches (1520 mm)** from air-supply diffuser or return-air opening.
 6. Lighting Fixtures: Locate detectors not closer than **12 inches (300 mm)** from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.
- E. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- F. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than **36 inches (9100 mm)** long shall be supported at both ends.
1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.
- G. Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location. Do not install smoke detectors in sprinklered elevator shafts.
- H. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.
- I. Audible Alarm-Indicating Devices: Install not less than **6 inches (150 mm)** below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.
- J. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least **6 inches (150 mm)** below the ceiling. Install all devices at the same height unless otherwise indicated.

- K. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.3 PATHWAYS

- A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.
 - 1. Exposed pathways located less than **96 inches (2440 mm)** above the floor shall be installed in EMT.
- B. Pathways shall be installed in EMT.
- C. Exposed EMT shall be painted red enamel.

3.4 CONNECTIONS

- A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 087100 "Door Hardware." Connect hardware and devices to fire-alarm system.
 - 1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.
- B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than **36 inches (910 mm)** from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
 - 1. Alarm-initiating connection to smoke-control system (smoke management) at firefighters' smoke-control system panel.
 - 2. Alarm-initiating connection to stairwell and elevator-shaft pressurization systems.
 - 3. Magnetically held-open doors.
 - 4. Electronically locked doors and access gates.
 - 5. Alarm-initiating connection to elevator recall system and components.
 - 6. Alarm-initiating connection to activate emergency lighting control.
 - 7. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
 - 8. Supervisory connections at valve supervisory switches.
 - 9. Supervisory connections at elevator shunt-trip breaker.
 - 10. Data communication circuits for connection to building management system.

3.5 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.6 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by **authorities having jurisdiction**.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Perform the following tests and inspections **with the assistance of a factory-authorized service representative**:
 - 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
 - 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
 - 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
 - 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
 - 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- F. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.
- H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.
- I. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.7 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include **12** months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 - 1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.8 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for **two** years.
- C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within **two** years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
 - 1. Upgrade Notice: At least **30** days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

3.9 DEMONSTRATION

Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 284621.11

SECTION 4 – STANDARD PURCHASE DEFINITIONS

The City will use the following definitions in instructions to Bidders, terms and conditions, special provisions, technical specifications and any other solicitation documents.

1. **Addendum** is a formal written document, released prior to the public opening that modifies any aspect of a Solicitation. Plural: Addenda
2. **Alternate Bid** means multiple Bids with substantive variations from the same Bidder in response to a Solicitation.
3. **Amendment** is a formal written agreement, signed by both parties, that modifies an existing contractual agreement.
4. **Appropriate, Appropriated, or Appropriation** means the adoption by the City Council of the City of a budget for a fiscal year that includes payments to be made under the Contract during the respective fiscal year.
5. **Best Value** means the highest overall value to the City based on factors that include, but are not limited to, price, quality, design, and workmanship.
6. **Bid** is a complete, properly signed response to an Invitation to Bid, which if accepted, would bind the Bidder to perform the resultant Contract.
7. **Bid Guaranty (Bid Bond)** guarantees that the Bidder (a) will not withdraw the Bid within the period specified for acceptance, and (b) will execute a Contract and furnish required bonds and any necessary insurance within the time specified in the Solicitation, unless a longer time is allowed by the City. The guarantee will be returned to the Bidder upon execution of a Contract.
8. **Bidder or Proposer** is a person, firm, or entity that submits a Response to a Solicitation. Any Bidder/Proposer may be represented by an agent after submitting evidence demonstrating the agent's authority. The agent cannot certify as to his own agency status.
9. **City** means the City of Port Orange.
10. **Competitive (Formal) Solicitation** is the process of requesting and receiving two or more sealed bids, proposals, statements of qualifications or replies submitted by responsive bidders/proposers in accordance with the terms of a competitive process, regardless of the method of procurement.
11. **Competitive Range** means the responsive submissions that meet the evaluation criteria and are considered to be reasonably susceptible of award.
12. **Construction** means the process of building, repairing, improving, and alterations, conversion or extension of building, parks, utilities, streets or other improvements or alterations to real property.
13. **Contract** is a written agreement or purchase order issued for the purchase of goods or services.
14. **Contractor** means the person, firm or entity selling goods or services to the City under a Contract.
15. **Deliverables** means the goods, products, materials, and/or services to be provided to the City by a Bidder.
16. **Due Date** means the date and time specified for receipt of Responses to a Solicitation.
17. **End User** is a person, program, agency, or other eligible user who uses a contract to purchase a commodity or contractual service.
18. **Goods** are supplies, materials, or equipment.
19. **Intent to Award** is a document, published on Onvia/DemandStar, that informs the public and respondents of the City's decision to award a contract pursuant to a previously issued competitive solicitation.
20. **Invitation to Bid (ITB) or Bid** means a formal request to prospective bidders requesting pricing for a specified Good or Service which has been advertised for Bid in a newspaper.
21. **Issues** means points, matters, or concerns to be addressed during negotiations.
22. **Lowest Responsible Bid means the responsive Bid** meeting all requirements of the specifications, terms, and conditions of the Invitation to Bid resulting in the lowest cost to the City in a total cost concept or based solely on price, taking into consideration the financial and practical ability of the Bidder to perform the Contract, past performance of the Bidder, and compliance with all City ordinances concerning the purchasing process.
23. **Lowest Responsible Bidder** means the Bidder submitting Lowest Responsible Bid.

24. **Offer** means a complete signed Response submitted to the City in response to a Solicitation, such as a Bid submitted in response to an Invitation to Bid.
25. **DemandStar** is the official online repository for all City competitive solicitations.
26. **Outlier** is a bid, offer, or proposal which is determined by the Purchasing Director or Manager to be significantly dissimilar to or inconsistent with, competing bids or offers.
27. **Pre-Bid Conference** means a meeting conducted by the Purchasing Office, held in order to allow Bidders/Proposers to ask questions about the proposed Contract and particularly the Contract specifications with the City department requesting the goods/services.
28. **Price Analysis** is an evaluation of the total cost of a contract in order to determine if the price is reasonable.
29. **Procurement (Process)** is a term used in the governmental sector for the combined functions of acquiring (purchasing) needed goods and/or services, receiving and inspection, inventory management, contract administration, and disposal/surplus.
30. **Professional Services** means those services within the scope of the practice of architecture, professional engineering, landscape architecture, or registered surveying and mapping, as defined by the laws of the state, or those performed by any architect, professional engineer, landscape architect, or registered surveyor and mapper in connection with his or her professional employment or practice.
31. **Protest** is a formalized process by which respondents have an opportunity to challenge a procurement practice or contract award.
32. **Purchase Order** is an order placed by the Purchasing Division for the purchase of Goods or Services written on the City's standard Purchase Order form and which, when accepted by the Bidder, becomes a contract. The Purchase Order is the Bidder's authority to deliver and invoice the City for Goods or Services specified, and the City's commitment to accept the Goods or Services for an agreed upon price.
33. **Respondent** means an entity that has (or will, i.e. "prospective respondents") submitted a response to a competitive solicitation conducted to create a contractual relationship for the provision of commodities or services.
34. **Response/Submission** means all materials submitted to the City by a respondent as part of a solicitation. A response may be called a bid, proposal, statement of qualifications, or a reply, depending on the type of competitive solicitation being issued.
35. **Responsible (Bidder)** is a Bidder who has the capability in all respects to fully perform the contract requirements and the integrity and reliability that will assure good faith performance.
36. **Responsive (Bidder)** is a Bidder that has submitted a bid, proposal, statement of qualifications, or reply that conforms in all material respects to the solicitation.
37. **Scope** means the extent of the area or subject matter that something deals with or to which it is relevant.
38. **Scope of Work** means a description of the work activities, deliverables, and/or timeline that a bidder must execute in terms of delivering specific commodities or in performance of contractual services.
39. **Services** include all work or labor performed for the City on an independent contractor basis other than construction.
40. **Solicitation** means a formal request, as applicable, for prospective Bidders/Proposers to submit responses to an Invitation to Bid, Request for Proposal, Request for Qualifications, Invitation to Negotiate, or a Request for Quotation.
41. **Solicitation Document** means a document, or collection of documents, either paper or electronic, that contains all information required to conduct a competitive procurement project according to § 287.057, Florida Statutes.
42. **Stakeholder** means an individual, who is not likely to become a supplier, who has an interest in the commodities/contractual services needed.
43. **Subcontractor** means a person, firm or entity providing goods or services to a Bidder/Proposer to be used in the performance of the Bidder/Proposer's obligations under the Contract.
44. **Subject Matter Expert** means a person who has working or expert knowledge about a particular topic or field.
45. **Unbalanced Bid** means a Bid that is based on prices which are significantly less than cost for some bid items and significantly more than cost for others.

SECTION 5 – GENERAL TERMS AND CONDITIONS

These instructions are standard for all contracts for commodities or services issued through the City of Port Orange Purchasing Division. General Requirements apply to all advertised Solicitations; however, **these may be superseded, in whole or in part, by the SPECIAL PROVISIONS/INSTRUCTIONS OR OTHER DATA CONTAINED HEREIN.**

1. ACCEPTANCE BY CITY

The City shall have a reasonable time (but not less than 30 days) after receipt to inspect the goods and services tendered by the Bidder. The City at its option may reject all or any portion of such goods or services which do not, in City's sole discretion, comply in every respect with all terms and conditions of the contract. The City may elect to reject the entire goods and services tendered even if only a portion thereof is nonconforming. If the City elects to accept nonconforming goods and services, the City, in addition to its other remedies, shall be entitled to deduct a reasonable amount from the price thereof to compensate the City for the nonconformity. Any acceptance by the City, even if non-conditional, shall not be deemed a waiver or settlement of any defect in such goods and services. The material delivered as a result of this solicitation shall remain the property of the seller until a physical inspection and actual usage of the item(s) is made and thereafter deemed acceptable to the satisfaction of the City, in compliance with the terms and specifications contained herein. In the event that the item(s) supplied to the City is/are found to be defective, or does/do not conform to specifications, the City reserves the right to cancel the order upon written notice to the seller and return the item(s) to the seller at the seller's expense.

2. ADDENDUM

When specifications are revised, the City of Port Orange Purchasing Division will issue an addendum addressing the nature of the change. Bidders should acknowledge all addenda by circling the number of addenda received on the "Bidder's Acknowledgment Form" and include it in the returned Response package. Failure to acknowledge the correct number of addenda issued may result in rejection of the Response. It is the responsibility of the Bidder to ensure all addenda have been received prior to submitting a bid. All Addenda shall be posted by the CITY on www.demandstar.com.

The City shall issue responses to inquiries and any other corrections or amendments it deems necessary in written addenda issued prior to the Solicitation Response Due Date. Bidders should not rely on any representations, statements or explanations other than those made in this Solicitation or in any addendum to the Solicitation. Where there appears to be a conflict between the Solicitation and any addenda issued, the last addendum issued shall prevail.

3. ADDITIONAL GOODS

Products, Materials and Goods not specifically identified in this bid request may be added to any resultant contract upon mutual consent of the contracting parties. The City reserves the right to add or delete products or materials of similar nature, within the family of products of "ITB Item(s)" and their commodity codes, to those items requested in this bid.

4. **ANTI-COLLUSION STATEMENT**

By submitting this Response to a Formal Solicitation, the Bidder affirms that this Response is without previous understanding, agreement, or connection with any person, business, or corporation submitting a Response for the same materials, supplies, or equipment, and that this Response is in all respects fair, and without collusion or fraud. Additionally, Bidder agrees to abide by all conditions of this Solicitation and certifies that they are authorized to sign this Response for the Bidder. In submitting a Response to the City of Port Orange, the Bidder offers and agrees that if the Response is accepted, the Bidder shall convey, sell, assign or transfer to the City of Port Orange all rights, title and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the State of Florida for price fixing relating to the particular commodities or services purchased or acquired by the City of Port Orange. At the City's discretion, such assignment shall be made and become effective at the time the City tenders final payment to the Bidder.

5. **APPLICABLE LAWS**

In connection with the furnishing of supplies or performance of work under the Contract, the Bidder agrees to comply with the Fair Labor Standards Act, Equal Opportunity Employment Act, and all other applicable federal and state laws, regulations and executive orders to the extent that the same may be applicable.

6. **ASSIGNMENT**

The successful Bidder shall not sell, assign, transfer or convey this contract in whole or in part, without the prior written consent of the City of Port Orange. Any such assignment or transfer shall not release the Bidder from all contractual obligations.

7. **AUTHORITY TO CONDUCT BUSINESS IN FLORIDA**

A Florida corporation or partnership is required to provide evidence with its response that the Bidder is authorized to transact business in Florida and is in good standing with the Florida Department of State. If not with its response, such evidence must be submitted to the City no later than five (5) business days from request of the Purchasing Manager.

A foreign (out-of-state) corporation or partnership is required to provide evidence with its response that the Bidder is authorized to transact business in Florida and is in good standing with the Florida Department of State. If not with its response, such evidence must be submitted to the City no later than five (5) business days from request of the Purchasing Manager.

A joint venture is required to provide evidence with its response that the joint venture, or at least one of the joint venture partners, is authorized to transact business in Florida and is in good standing with the Florida Department of State. If not with its response, such evidence must be submitted to the City no later than five (5) business days from request of the Purchasing Manager. However, the joint venture is required to provide evidence prior to contract execution that the joint venture is authorized to transact business in Florida and provide the City with a copy of the joint venture Agreement.

A joint venture is also required to provide with its response a Statement of Authority indicating that the individual submitting the joint venture's proposal has the legal authority to bind the joint venture. If not with its response, such evidence must be submitted to the City no later than five (5) business days from the request of the Purchasing Manager.

8. AWARDS

Results from the evaluation committee will be considered by the City of Port Orange City Council at the earliest possible regular meeting subsequent to the evaluation process. This ITB is issued in accordance with and shall be governed by the provisions of the City's Purchasing Policy.

The City of Port Orange City Council reserves the right to make award(s) by individual sections, groups, all or none, or a combination thereof, with one or more Bidders; to reject any and all proposals, or to waive any informality or technicality in proposals received as deemed to be in the best interest of the City.

The City does not award publicly funded contracts to those who knowingly employ unauthorized alien workers in violation of section 274A(e) of the Immigration and Naturalization Act, 8 United States Code s1324a(e). Such employment deprives legal workers of job opportunities. Violation of section 274A(e) shall be grounds for unilateral cancellation of the contract, Contract, proposal or quote for purchase of services and goods by the City of Port Orange.

9. AWARD AND EXECUTION OF CONTRACT

When a bid received has been determined to be satisfactory, a Contract will be awarded, or Purchase Order issued to the LOWEST Responsible Bidder within the time designated in the Contract Documents.

The Bidder(s) to whom the award is made shall execute the Contract(s) and return it, together with the properly executed bonds and insurance certificates to the office of the Owner, within the time specified

10. BID RETURNS

Bidders shall return all completed Responses to the City of Port Orange at the address set forth in Section 2 of this document on the date and at the time specified. Late submissions will not be accepted and shall be returned to Bidders unopened.

11. BID PROTEST

Any person who is adversely affected by the City's decision or intended decision shall file with the City Purchasing Manager a notice of protest in writing within 72 hours after the posting of the notice of decision or intended decision. With respect to a protest of the terms, conditions, and specifications contained in a solicitation, including any provisions governing the methods for ranking Bids, Proposals, Statements, or Replies, awarding contracts, reserving rights of further negotiation, or modifying or amending any contract, the notice of protest shall be filed in writing within 72 hours after the posting of the Solicitation. Saturdays, Sundays, and state holidays shall be excluded in the computation of the 72-hour time established herein. The formal written protest shall be filed with the Purchasing Manager in writing within ten (10) days after the date the notice of protest is filed. The formal written protest shall state with particularity the facts and law upon which the protest is based. Failure to file a notice of protest or failure to file a formal written protest shall constitute a waiver of proceedings. Upon receipt of the formal written protest that has been timely filed, the City shall stop the solicitation or contract award process until the subject of the protest is resolved by final City action. However, the City may continue the solicitation or award process, provided the City Manager sets forth in writing particular facts and circumstances which require the continuance of the solicitation or contract award process without delay in order to avoid an immediate and serious danger to the public health, safety, or welfare. The City shall provide an opportunity to resolve the protest by mutual agreement between the parties. The policy this City has established is as follows:

- a. As soon as possible after receipt, the Purchasing Manager shall provide written bid protest to City Manager, City Attorney, Department Head involved, and Supervisor directly involved in the acquisition.
- b. Purchasing Manager shall schedule within seven (7) business days, excluding weekends and holidays, a meeting with the above-mentioned individuals or designee and protestor. The intent of the meeting is to provide a review and/or solution prior to going before Council. After reviewing all relevant information, the City Manager shall render a decision.
- c. If the protestor disagrees, he may appeal to the City Council at a formal council meeting. After reviewing the evidence, the City Council will issue their decision. The City Council's decision is final; however, the protestor can appeal the decision to the Circuit Court in Volusia County, Florida within thirty (30) days of the City Council's final decision. Decisions at all levels shall be in writing to the protestor.

12. BID TABULATION

Bidders who wish to receive a copy of the bid tabulation may obtain it via www.demandstar.com or on the City of Port Orange website, Bid opportunities page at www.port-orange.org/bids.aspx or by email purchdiv@port-orange.org.

13. BONDS

If this Solicitation requires submission of bid guarantee and performance bonds, there will be a separate page explaining those requirements. Responses submitted without the required bid bond or certified check shall be deemed non-responsive. When the Purchasing Manager deems it necessary, bid bonds/deposits shall be prescribed and are advertised in the public notices inviting bids. Normally, if a bid bond/deposit is requested, it is in the amount of five percent (5%) of the bid amount. Payment and Performance Bonds requested for construction projects shall be in an amount equal to one hundred percent (100%) of the total contract amount. Upon award, the successful Bidder may also be required to furnish and pay for a satisfactory contract one hundred percent (100%) Payment and Performance Bond which will be recorded by the City, at the Bidder's sole cost and expense, with the Clerk of the Circuit Court, Volusia County, Florida, and to enter into a written contract with the City of Port Orange. After recording, the City will furnish to the Bidder the recording information for the bond to evidence that the Bidder has met the requirements of Florida law. The City will bill the cost of recording to the Bidder. Payment and Performance Bonds shall also be recorded at the Bidder's expense in the Office of the Clerk of the Circuit Court, Volusia County, Florida. All bonds no matter which kind, are advertised in the Solicitation which appears in the newspaper. Unsuccessful Bidders are entitled to the return of their surety where the Purchasing Manager has required such. A successful Bidder shall forfeit any surety required by the Purchasing Manager upon failure on the part of the Bidder to enter into a contract within the time specified after the award of bid.

14. CERTIFICATE OF INSURANCE

Upon issuance of a notice of intent to award, the selected Bidder will be required to submit a Certificate of Insurance showing proof of adequate coverage for professional general liability, errors and omissions and workers' compensation as identified under the insurance requirements of this solicitation and listing the City of Port Orange as Additional Insured prior to execution of the contract.

15. CHANGE ORDERS

No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change order requests shall be made in writing by the Bidder for review by the Contract Administrator for the City of Port Orange. No work shall be performed as set forth in the change order until the Bidder receives an executed Purchase Order for the requested change.

16. CHANGE ORDER REQUEST NOTIFICATION

The Successful Bidder is responsible for giving the City of Port Orange, prior to the Contract expiration date, at least forty-five (45) calendar day's advance notice for any anticipated changes in price greater than \$25,000.00, time and/or scope of the awarded Contract. The Bidder shall not continue to provide services past the Contract expiration date unless approved by a written Change Order Notice from the City.

17. CLEAN UP

Upon completion of the delivery of materials, the Bidder shall restore any/all public and private property which was damaged during delivery. Restoration is meant to include removal of any spillage or restoring damage to the edge of pavement, sidewalks, driveways, landscaped areas, etc. Bidder shall make repairs consistent with or better than what existed prior to delivery. This shall be understood to include the use of sod or seed and mulch to replace (if necessary) existing grass that has been damaged. If sod is used it shall match the sod present on the effected property. Bidder shall make all repairs and restorations at his expense.

18. CONDUCT OF BIDDERS

All Bidders or individuals acting on behalf of a Bidder are hereby prohibited from lobbying or otherwise attempting to persuade or influence any member of the Evaluation Committee, City Council members, or City staff at any time during the course of the solicitation process. The solicitation process shall end upon issuance of the written City Manager and staff recommendation for selection of a Bidder. All Bidders or individuals acting on behalf of a Bidder are further prohibited from contacting or otherwise attempting to communicate with any member of the staff, Evaluation Committee or City Council members regarding the pending solicitation or its outcome until after the issuance of the written recommendation of the most qualified Bidder. Until such recommendation is issued in writing, any questions regarding the pending solicitation shall be submitted to the Purchasing Manager. Failure to comply with this procedure shall result in rejection/disqualification of said submittal without exception. Contact with staff, City Council members and the Evaluation Committee during a public meeting shall not be considered a violation of this requirement.

19. CONE OF SILENCE

The Cone of Silence is designed to protect the integrity of the procurement process by shielding it from undue influences prior to the execution of the award.

The Cone of Silence is defined as the period beginning with the issuance of the solicitation document and continues through the execution of the award document. During this time Bidders, service providers and the like are prohibited from all communications regarding the solicitation with City staff, City consultants, City legal counsel, City Agents, or elected officials. Any Bidder who initiates any discussions or attempts to influence a member or members of the aforementioned shall be disqualified from continued participation in the procurement process with regard to that particular solicitation.

Exceptions to the Cone of Silence:

- Written communication directed to the Procurement Officer;
- All communications occurring at Pre-Proposal Conferences;
- Oral presentations before publicly notice committee meetings;
- Procurement of goods and services for Emergency situations; and
- Contractors already on contract with the City to perform services for the City are allowed discussions necessary for the completion of an existing contract.

20. CONFLICT OF INTEREST

For purposes of determining any possible conflict of interest, all Bidders must disclose if any City of Port Orange employee is also an owner, corporate officer, or employee of Bidder's business. No official or employee of the City who exercises any functions or responsibilities in the review or approval of the undertaking or carrying out of the Scope of Work covered by the Contract shall voluntarily acquire any personal interest, directly or indirectly, in the contract or proposed Contract.

21. CONFLICT OF INSTRUCTIONS

If a conflict exists between the General Terms and Conditions and instructions contained herein, and the Special Terms and Conditions and instructions contained herein, the Special Terms and Conditions shall govern.

22. CONTRACT

Any acquisition above the \$25,000 level shall be done through one of the formal competitive methods except upon City Council waiver and/or shall have City Council approval. Only the Purchasing Manager and/or City Manager, have the authority to obligate the City by entering into a written contract to purchase goods and/or services up to \$25,000.00. The City of Port Orange, Florida reserves the right to reject any and all Responses or to waive any and all non-substantial irregularity in Responses received, whenever such waiver or rejection is in the best interest of the City.

23. CONTRACT OBLIGATION

Except as otherwise stated herein, the City of Port Orange City Council shall approve the contract if greater than \$25,000.00 annually. The Mayor or other person authorized by the Mayor must sign the contract before it becomes binding on the City of Port Orange or the Bidder. Department heads are NOT authorized to sign contracts for the City of Port Orange. Binding agreements shall remain in effect until all products and/or services covered by this purchase have been satisfactorily delivered and accepted.

24. CONTRACT RENEWALS

Renewals may be made ONLY by written agreement between the City of Port Orange and the Bidder. Any price escalations are limited to those stated by the Bidder on the original Response.

25. COPYRIGHT AND PATENT RIGHTS

Bidder warrants that there has been no violation of copyrights or patent rights in manufacturing, producing and/or selling the item(s) ordered or shipped as a result of this Response, and successful Bidder agrees to hold the City harmless from any and all liability, loss or expense by any such violation.

26. COST INCURRED BY BIDDER

All expenses, including costs for required bonds, involved with the preparation and submission of Responses to the City, or any work performed in connection therewith shall be borne by the Bidder. No payment shall be made for any response received, nor for any other effort required of or made by the Bidder prior to commencement of work as defined by the contract approved by the City Council.

27. DAMAGE

Any damage to driveways, irrigation systems, sidewalks, pavement, or landscaping will be evaluated by the City's representative and the Bidder. If the Bidder is found to be at fault, all repairs, restitution, or reimbursements to the County must be completed within one week of discovery.

28. DEBARMENT HISTORY

The City will consider a Bidder's debarment history information in its review and determination of responsibility. All Bidders are required to disclose to the City all cases of debarment filed, pending, or resolved by the City or other public entity during the last five (5) years prior to the solicitation response due date, whether such actions were brought by or against the Bidder, any parent or subsidiary of the Bidder, or any predecessor organization. If the Bidder is a joint venture, the information provided should encompass the joint venture (if it is not newly formed for purposes of responding to the solicitation) and each of the entities forming the joint venture. Although the review of a Bidder's debarment history is an issue of responsibility, the failure to provide debarment history as required in the Proposal Submittal and Requirements Section may result in a recommendation of non-responsive by the Purchasing Manager.

29. DEFAULT PROVISIONS

In the event of default by the Bidder, the City reserves the right to procure the item(s) bid from other sources and hold the Bidder responsible for excess costs incurred as a result. If a Bidder defaults on a City contract, the City Council may elect to refrain from doing business with the Bidder for a period of 36 months from the date of default.

30. DELIVERY OF GOODS/SERVICES

All materials are to be delivered F.O.B.; City of Port Orange designated facility. Delivery dates pertaining to this invitation must be clearly stated in the bid form where required and include weekends and holidays. Failure to comply with this requirement may be a cause for disqualification of bid. Unless otherwise specified, delivery at the earliest date is required. The Bidder shall clearly state in the Response the time required for delivery upon receipt of contract or purchase order. Proposed delivery time must be specific and such phrases "as required," "as soon as possible" or "prompt" may result in disqualification of the bid. Delivery time will be a factor for any orders placed as a result of this Response. The City reserves the right to cancel such order(s) or any part thereof, without obligation, if delivery is not made within the time(s) specified herein and hold the bidder in default. Upon approval of a contract, the bidder is obligated to deliver the goods to the destination specified in the Solicitation or the Purchase Order and bears the risk of loss until delivery. If this Solicitation or Purchase Order does not contain delivery instructions, Bidder shall request instructions in writing from the Purchasing Manager. If the delivery instructions contained in the Solicitation allocate delivery costs and risks in a manner contrary to this section, the provisions of this Competitive Solicitation shall prevail. When delivery is not met as provided for in the contract, the Purchasing Division reserves the right to make the purchase on the open market, with any cost in excess of the contract price paid by the Bidder, in addition to any other damages, direct or consequential, incurred by the City as a result thereof. In addition, failure of the Bidder to meet the contract delivery dates will be cause for removal of the Bidder from the City's list of eligible Bidders as determined by the Purchasing Division.

31. DETERMINATION OF LOWEST AND BEST RESPONSIBLE BIDDER

In determining the lowest and best responsible Bidder, in addition to price, there will be considered the following:

- a. The ability, capacity and skill of the Bidder to perform the contract.
- b. Whether the Bidder can perform the contract within the time specified, without delay or interference.
- c. The character, integrity, reputation, judgment, experience, and efficiency of the Bidder.
- d. The quality of performance of previous contracts.
- e. The previous and existing compliance by the Bidder with laws and ordinances relating to the contract.
- f. The sufficiency of the financial resources and ability of the Bidder to perform the contract or provide the service.
- g. The quality, availability and adaptability of the supplies or contractual services to the particular use required.
- h. The ability of the Bidder to provide further maintenance and service for the use of the subject of the contract.
- i. The number and scope of conditions attached to the bid.
- j. Such other factors as appear to the city council to be pertinent to the bid or the contract under all of the circumstances involved.

32. DISCLOSURE OF CONFLICTS

The award is subject to the provisions of Chapter 112.313, Florida Statutes. All Bidders must disclose with their Response the name of any officer, director, or agent who is also an employee of the City. Further, all Bidders must disclose the name of any employee who owns, directly or indirectly, an interest in the Bidder's firm or any of its branches. The Bidder shall not compensate, in any manner, directly or indirectly, any officer, agent, or employee of the City for any act or service that he/she may do, or perform for, or on behalf of any officer, agent or employee of the Bidder. No officer, agent, or employee of the City shall have any interest, directly or indirectly, in any contract or purchase made, or authorized to be made by anyone for, or on behalf of the City. The Bidder shall have no interest and shall not acquire any interest that shall conflict in any manner or degree with the performance of the services required under the Solicitation.

33. DISQUALIFICATION OF BIDDER

The Purchasing Manager shall maintain a current listing of qualified Bidders. The Purchasing Manager may, from time to time, remove any bidder's name from the list of qualified Bidders. Normally the removal of a bidder from the bidder list is done after nonresponse from that bidder for three (3) consecutive Solicitations. Such action may also arise out of breach of contract, default, or irregular business practice, based on the Finance Director and City Attorney's recommendation. Any or all Responses may be rejected if the City believes that collusion exists among the Bidders. Responses in which the prices are obviously unbalanced may be rejected. If multiple Responses are submitted by a Bidder and after the Responses are opened one of the Responses is withdrawn, the result will be that all of the Responses submitted by that Bidder will be withdrawn; however, nothing herein prohibits a bidder from submitting multiple Responses for different products or services.

34. EVALUATION

Evaluation shall be used as a determinant as to which Response items or services are the most efficient and/or most economical for the City. It shall be based on all factors which have a bearing on price and performance of the items in the user environment. All Responses are subject to tabulation by the City of Port Orange Purchasing Division and recommendation to the governing body. Compliance with all Solicitation requirements, delivery and needs of the using department are considerations in evaluating Responses. Pricing is NOT the only criteria for making a recommendation. The City of Port Orange Purchasing Division reserves the right to contact any Bidder, at any time, to clarify, verify or request information with regard to any Response.

35. EXCEPTIONS TO SPECIFICATIONS

For purposes of evaluation, the Bidder must indicate any exception to the specifications, terms, and/or conditions, no matter how minor. This includes any agreement or contract forms supplied by the Bidder that are required to be signed by the City. If exceptions are not stated by the Bidder, in his bid, it will be understood that the item(s)/services fully comply with the specifications, terms and/or conditions stated by the City. Exceptions are to be listed by the Bidder on an attachment included with the bid. The City will not determine exceptions based on a review of any attached sales or manufacturer's literature.

36. E-VERIFY

Bidders shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Bidder during the term of contract and shall expressly require any subcontractor performing services pursuant to the contract to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the term of contract.

37. FACILITIES

The City reserves the right to inspect the Bidder's facilities at any time.

38. FAILURE TO RESPOND

If the bidder elects not to bid, please return the enclosed "Bidder's Acknowledgement Form" by the bid due date and state the reason(s) for not bidding. Failure to respond, either by submitting a bid, or by submitting a "Statement of No Bid", three (3) times, shall result in the bidder's name being removed from the City's mailing list.

39. FINANCIAL STABILITY

Bidders shall be prepared to supply a financial statement upon request, preferably a certified audit of the last available fiscal year. A third party prepared financial statement and the latest Dunn & Bradstreet report will be accepted in lieu thereof.

40. FORCE MAJEURE

Neither party shall be liable for any delay in performance or failure to perform any obligation hereunder if, and to the extent that, such failure or delay is caused by an event of Force Majeure. Force majeure shall mean any act, event or condition that is beyond the party's reasonable control, that materially and adversely affects the party's ability to perform its obligations hereunder, and that is not the result of the party's willful neglect, error, omission or failure to exercise reasonable due diligence.

41. GOVERNING FORMS

In the event of any conflict between the terms and provisions of these requirements and the specifications, the specifications shall govern. In the event of any conflict of interpretation of any part of this overall document, the City's interpretation shall govern.

42. GOVERNING LAW

Bidders shall comply with all applicable federal, state and local laws and regulations. All Responses are solicited and shall be made pursuant to the Code of Ordinances, City of Port Orange, Chapter 2, Article VI, Division 2, Section 2-263, and all Responses will be evaluated in accordance with the provisions thereof. Code of Ordinances, City of Port Orange is on file in the Office of the City Clerk, City Hall, 1000 City Center Circle, Port Orange, Florida and at www.municode.com.

The City of Port Orange is also governed by the Consultants' Competitive Negotiation Act, Section 287.055, Florida Statutes, as the method of selecting architects, engineers and land surveyors. The City has utilized the procedures in the Act for Professional counselors, environmentalists, planners, general contractors, computer systems, designers, telecommunications consultants, maintenance technicians, financial services and other professional services.

Every acquisition equal to or greater than \$10,000.00 must have a signed, notarized "Public Entity Crimes Form" to comply with Section 287.133(3)(a), Florida Statutes. Also required is the "Drug-Free Preference Form" to comply with Section 287.087, Florida Statutes. Each form is included in the Solicitation.

43. GRANT FUNDING

Any contract entered into by the City that is to be paid from grant funds shall be limited to payment from the grant funding and the Bidder understands that the City has not set aside any City funds for the payment of obligations under a grant contract. If grant funding should become unavailable at any time for the continuation of services paid for by the grant, and further funding cannot be obtained for the contract, then the sole recourse of the provider shall be to terminate any further services under the contract and the contract shall be null and void.

44. HIPAA COMPLIANCE

The Bidder agrees to comply with the Standards for Privacy of Individually Identifiable Health Information of the Health Insurance Portability and Accountability Act of 1996, PL 104-191, 45 CFR Parts 160-164, as amended, referred to as "HIPAA," to the extent that the Bidder uses, discloses or has access to protected health information as defined by HIPAA.

45. IDENTICAL TIE BIDS

When identical prices are received from two or more Bidders and all other factors are equal, priority for award shall be given to bidders in the following sequence:

1. Drug-free workplace pursuant to Section 287.087, Florida Statutes.
2. Certified service-disabled veteran.
3. Local businesses as defined in Section 2-275 of the Code of Ordinances.
4. Firm with the lowest volume of work on City projects within the last five years. The information will be based on information provided by the Bidder, subject to verification at the City's option.

46. INDEMNIFICATION/HOLDHARMLESS

(a) Bidder shall be liable for any loss of, or damage to, City property caused by the negligence, recklessness, or intended wrongful misconduct of Bidder, his/its agents, servants and employees and shall indemnify and save the City harmless against all actions, proceedings, claims, demands, costs, damages and expenses, including attorney's fees, by reason of any suit or action brought for any actual or alleged injury to or death of any person or damage to property other than City property, resulting from the performance of the Contract by the Bidder, his/its agents, servants and employees. Bidder shall submit a full written report to the Finance Director within twenty-four (24) hours following the occurrence of such damage, loss or injury.

(b) To the fullest extent permitted by law, in addition to the express duty to indemnify City when there is any causal connection between Bidder's work and any injury, loss, damage, death or property damage, Bidder expressly undertakes a duty to defend City as a separate duty, independent of and broader than the duty to indemnify. The duty to defend agreed to by Bidder hereby expressly include all costs of litigation, attorney's fees, settlement costs and reasonable expenses in connection with the litigation, whether or not the claims made for loss, injury, damage or property damage are valid or groundless and regardless of whether the defense of City is maintained by the City or assumed by Bidder as long as the claims made could be causally connected to Bidder as reasonable determined by the City.

47. INDEPENDENT CONTRACTOR

It is expressly understood and agreed by both parties hereto that the City is contracting with the successful bidder as an independent contractor. The parties hereto understand and agree that the City shall not be liable for any claims which may be asserted by any third party occurring in connection with the services to be performed by the successful bidder under this contract and that the successful bidder has no authority to bind the City.

The Bidder represents itself to be an independent contractor offering such services to the public and shall not represent himself or his employees to be an employee of the City. Therefore, the Bidder shall assume all legal and financial responsibility for taxes, FICA, employee fringe benefits, worker's compensation, employee insurance, minimum wage requirements, overtime, etc., and agrees to indemnify, save, and hold the City, its officers, agents, and employees, harmless from and against, any and all loss; cost (including attorney's fees); and damage of any kind related to such matters. The Bidder shall further understand that the City cannot save and hold harmless and or indemnify the Bidder and/or the Bidder's employees against any liability incurred or arising as a result of any activity of the Bidder or any activity of the Bidder's employees performed in connection with the Contract.

48. INSPECTIONS AND TESTING

City of Port Orange reserves the right to inspect any item(s) or service location for compliance with specifications and requirements and needs of the using department. If a Bidder cannot furnish a sample of a Response item, where applicable, for review, or fails to satisfactorily show an ability to perform, the City can reject the Response as inadequate and non-responsive.

49. INSURANCE CANCELLATION

No change or cancellation in insurance shall be made without thirty (30) days' written notice by the Bidder to the City. Insurance coverage required in these specifications shall be in force throughout the contract term. Should any awardee fail to maintain or to provide acceptable evidence of current insurance within five (5) days after receipt of written notice at any time during the contract term, the City shall have the right to consider the Contract breached which shall justify the termination thereof.

50. **INSURANCE REQUIREMENTS**

Bidder shall maintain insurance, as required herein, during the life of this Contract. Bidder shall provide to the City, a certificate of insurance endorsing the City of Port Orange as an additional named insured. All insurance coverages of the Bidder shall be primary and non-contributory. All insurance coverages of the Bidder shall not seek contribution from any other insurance or self-insurance available to the City. For workers' compensation coverage, the Bidder's insurance certificate shall include the insurer's waiver of subrogation in lieu of endorsing the City as an additional insured for workers' compensation.

IMPORTANT: The City does not accept Workers' Compensation Exemptions. Bidder may use leased employees if the Bidder ensures that all workers who access the jobsite are employees covered by the employee leasing company, and no non-employees are permitted to access the jobsite. Any Bidder using a leased employee shall complete the City's Leased Employee Affidavit Form Exhibit. Policies for Workers' Compensation may be issued by companies authorized as a group self-insurer by F.S. 440.572. Policies other than Workers' Compensation shall be issued by insurers licensed and/or duly authorized under Florida Law to do business in the State of Florida and all insuring companies are required to have a minimum rating of "A-" in the "Best Key Rating Guide" published by A.M. Best & Company, Inc. Bidder shall not commence work under this Contract until the City has received a certificate or certificates of insurance with endorsement evidencing the required insurance. Insurer shall provide the City written notice of cancellation, non-renewal or any other changes in coverage no later than thirty (30) days prior to the effective date of the change and shall provide notice to the City no later than 10 days after non-payment. The Certificates of Insurance and required insurance policies shall contain provisions that thirty (30) days prior written notice shall be given to the City of any cancellation, intent not to renew, or reduction in the policies or coverages.

Bidder shall require and ensure each of its subcontractors to maintain, until the completion of the subcontractor's work, insurance of the types and to the limits set forth herein. All insurance coverages shall be primary and non-contributory. All insurance coverages of the subcontractors shall not seek contribution from any other insurance or self-insurance available to the City. The Bidder is responsible for ensuring that its subcontractors maintain the required coverage. Failure of the Bidder to ensure the subcontractors maintain the required coverage, shall not relieve the Bidder of any contractual responsibility, obligation or liability.

The City reserves the right to increase insurance coverage as determined for higher risk contracts. The acceptance by the City of any Certificate of Insurance does not constitute approval or agreement by the City that the insurance requirements have been satisfied or that the insurance policy shown on the Certificate of Insurance is in compliance with and does not waive the insurance required by this.

Should at any time the Bidder or subcontractors not maintain the insurance coverages required herein, the City may terminate the Contract or at its sole discretion shall be authorized to purchase such coverages and charge the Bidder for such coverages purchased. The City shall be under no obligation to purchase such insurance, nor shall it be responsible for the coverages purchased or the insurance company or companies used. The decision of the City to purchase such insurance coverages shall in no way be construed to be a waiver of any of its rights under the Contract.

Standard Insurance Requirements			
	Insurance	Standards	Additional Requirements
REQUIRED	<u>Workers' Compensation</u> The Bidder shall maintain coverage for its employees with statutory workers' compensation limits, and no less than the limits indicated in the Schedule of Limits for Employers' Liability. Said coverage shall include a waiver of subrogation in favor of the City. The City will not accept elective exemptions. Any bidder using an employee leasing company shall complete the Leased Employee Affidavit Form Exhibit.	<u>Contract Amount Limits</u> Up to \$10 million Statutory/\$500,000 \$10 - \$20 million Statutory/\$1,000,000 Contracts over \$20 million To Be Determined by the City.	☐ If Contract requires work on or about navigable waters, Longshoreman's and Harbor Workers' Coverage required. ☐ If vessels involved, Jones Act coverage with limits of \$500,000 required.
REQUIRED	Comprehensive General Liability (including Completed Operations and Contractual Liability)	<u>Limits:</u> Combined Single Limit Bodily Injury and Property damage \$1,000,000 occurrence \$1,000,000 aggregate	☐ When work is on or under Railroad rights of way or properties, the Bidder shall take out and maintain during the life of the Contract, Railroad protective liability and property damage insurance in amounts as requested by the Railroad.
REQUIRED	Comprehensive Business, Automobile Liability to include all owned, hired and non-owned automobiles.	<u>Limits:</u> Auto Liability Body Injury and Property Damage: \$1,000,000 each occurrence \$1,000,000 aggregate	
Additional Insurance Requirements			
REQUIRED	Property Insurance Builders Risk. <u>Additional Coverage:</u>	Limits: Buildings - Completed value of Contract. "All Risk" coverage on latest ISO for or its equivalent. Permission granted to occupy. Owner named as insured AIMA	If Agreement requires handling or installation of Owner's equipment, coverage should be furnished on "All Risk" form, including transit and Owner shall be named.
☐	Professional Liability	Limits: Coverage - \$1,000,000	
☐	Installation Floater (IT)	Limits: Coverage - \$ <u>To be determined.</u>	
☐	Contractor Pollution Liability	Limits: Coverage - \$1,000,000	
☐	Errors and Omissions	Limits: Coverage - \$1,000,000	
☐	Umbrella Policy	Limits: Coverage – \$ <u>To be determined.</u>	
REQUIRED	Payment and Performance Bond Required	Limits: Coverage - Equal to amount of Contract.	
☐	City Manager waives Payment and Performance Bond for work under \$25,000.00.		
☐	Unless otherwise required by law, City Manager waives Insurance for FOB goods under \$25,000.00.		

51.
INVOICES AND PAYMENTS

All invoices shall be sent to: City of Port Orange, Accounts Payable, P.O. Box 291759, Port Orange, Florida, 32129. In accordance with Florida Statutes, Chapter 218, payment will be made within 45 days after receipt of merchandise and a proper invoice. The City will attempt to pay within fewer days if Bidder offers a payment discount. The City cannot make advance payments, make deposits in advance of receipt of goods, or pay C.O.D. Bidders should state any payment discount in the space provided on the bid form for construction services.

52.
IRREVOCABILITY OF RESPONSES

Each Bidder agrees that Responses shall remain open until the effective date not to exceed 90 days after selection, shall not be subject to revocation or withdrawal, and shall be subject to the City Council's acceptance of a contract with the Bidder.

53. LATE SUBMISSIONS, LATE MODIFICATIONS AND LATE WITHDRAWALS

Responses received after the Response Due Date and time are late and shall not be considered. Modifications received after the Response Due Date are also late and shall not be considered. Letters of withdrawal received after the Response Due Date are late and shall not be considered. Letters of withdraw received after contract award shall be deemed a breach of contract, subject to penalties as set forth in the contract and Solicitation.

54. LEGAL REQUIREMENTS

Applicable provision of all federal, state, county and local laws, and all ordinances, rules, and regulations shall govern development, submittal and evaluation of all Responses received in response hereto and shall govern any and all claims and disputes which may arise between person(s) submitting a response to a Solicitation hereto and the City by and through its officers, employees and authorized representatives, or any other person, natural or otherwise; and lack of knowledge by any Bidder shall not constitute a cognizable defense against the legal effect thereof.

55. LICENSES, PERMITS AND TAXES

The Bidder shall comply with all rules, regulations, laws and permitting requirements of the City, Volusia County, the State of Florida, and the United States Government now in force or hereafter to be adopted. The Bidder shall abide by all ordinances and laws pertaining to his operations and shall secure, at his expense, all licenses and permits necessary for construction and operation.

56. LITERATURE (if applicable)

If no brand, model or make is specified, Bidders shall submit descriptive literature and technical data, fully detailing all features, designs, construction, appointments, finishes and the like not covered in the specifications, necessary to fully describe the equipment, material, and/or services he proposes to furnish.

57. LOCAL PREFERENCE

In accordance with City of Port Orange City Code 2-275, except where federal or state law, or any other funding source, mandates to the contrary, the City shall give preference to local businesses in the following manner:

(a) Competitive Bids

- (1) Port Orange Business: In any competitive bidding process where a bid submitted by a Port Orange business is within eight percent (8%) of the lowest and best responsible bid submitted by a non-Port-Orange business, then the Port Orange business shall have the opportunity to submit, within five (5) working days of the bid opening, a best and final bid equal to or lower than the amount of the original low bid. The bid shall then be awarded to the lowest and best responsible bidder.
- (2) Volusia County business: In any competitive bidding process where a Volusia County business is within five percent (5%) of the lowest and best responsible bid submitted by a business other than a Port Orange business or Volusia County business, then the Volusia County business shall have the opportunity to submit, within five (5) working days of the bid opening, a best and final bid equal to or lower than the amount of the original low bid. The bid shall then be awarded to the lowest and best responsible bidder.
- (3) Florida Business: In any competitive bidding process where a State of Florida business is within three percent (3%) of the lowest and best responsible bid submitted by a non-local business, then the Florida business shall have the opportunity to submit, within five (5) working days of the bid opening, a best and final bid equal to or lower than the amount

of the original low bid. The bid shall then be awarded to the lowest and best responsible bidder.

- (4) Tied Bid Preference: In case of a tie bid between a local business and a non-local business, the local business shall prevail. In case of a tie between two or more local businesses, the following order of preference shall control: first priority to Port Orange business, second priority to Volusia County business, and third priority to Florida business.

- (b) Definitions. The following words, terms and phrases, when used in this section, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Port Orange Business means a business having its headquarters and principal place of business within the City of Port Orange at least twelve (12) months prior to the bid or proposal opening date, as evidenced by a valid business tax receipt or such other documentation, to the City's satisfaction, demonstrating the physical business presence of the firm within the limits of the City of Port Orange.

Volusia County Business means a business having its headquarters and principal place of business within the County of Volusia, and not within the City of Port Orange, at least twelve (12) months prior to the bid or proposal opening date, as evidenced by a valid business tax receipt or such other documentation, to the City's satisfaction, demonstrating the physical business presence of the firm within the limits of Volusia County.

Florida Business means a business having its headquarters and principal place of business within the State of Florida, and not within Volusia County, at least twelve (12) months prior to the bid or proposal opening date, as evidenced by a valid business tax receipt or such other documentation, to the city's satisfaction, demonstrating the physical business presence of the firm within the limits of the State of Florida.

58. **MAINTENANCE**

Maintenance required for equipment Solicitation is preferred to be available in the City of Port Orange by a manufacturer-authorized maintenance facility.

59. **NAME BRANDS**

Specifications may reference name brands and model numbers. It is not the intent of the City of Port Orange to restrict these bids in such cases, but to establish a desired quality level of merchandise or to meet a pre-established standard due to like existing items. Bidders may offer items of equal stature and the burden of proof of such stature rests with the Bidder, unless otherwise specified by the City. The City of Port Orange shall act as sole judge in determining equality and acceptability of products offered.

60. **NON-DISCRIMINATION**

There shall be no discrimination as to race, color, religion, gender, age, marital status, national origin, ancestry, and physical or mental disability in the operations conducted under this contract. Included as applicable activities by the bidder under this section are the solicitation for or purchase of goods or services, or the subcontracting of work in performance of this contract.

61. **NON-EXCLUSIVITY OF CONTRACT**

The selected Bidder understands and agrees that any resulting contractual relationship is non-exclusive, and the City of Port Orange reserves the right to seek similar or identical services elsewhere if deemed in the best interest of the City of Port Orange.

62. NON-PERFORMANCE

Failure to meet the expected quality of workmanship, schedule, or other criteria agreed upon, shall be considered a default. In case of default, the City may procure the required services from other sources and hold the Consultant responsible for any excess costs occasioned thereby and may immediately cancel the contract.

63. NOTICE TO BIDDER

The employment of unauthorized aliens by any bidder is considered a violation of Section 274A (e) of the Immigration and Nationality Act. If the bidder knowingly employs unauthorized aliens, such violation shall be cause for unilateral cancellation of the contract.

64. OPTIONAL CONTRACT USAGE

As provided in Section 287.042(16), Florida Statutes, State of Florida agencies may purchase from a contract resulting from this solicitation, provided the Department of Management Services, Division of Purchasing, has certified its use to be cost effective and in the best interest of the State. Bidder(s) may sell such commodities or services certified by the Division to State of Florida agencies at the bidder's option.

65. OTHER AGENCIES

- (a) All Bidders awarded contracts from this Bid may, upon mutual agreement, permit any municipality or other governmental agency to participate in the contract under the same prices, terms, and conditions, if agreed to by both parties.
- (b) It is understood that at no time will any city, municipality, or other agency be obligated for placing an order for any other city, municipality, or agency; nor will any city, municipality, or agency be obligated for any bills incurred by any other city, municipality, or agency. Further, it is understood that each agency will issue its own purchase order to the awarded Bidder(s).

66. PATENTS/COPYRIGHTS

The successful bidder agrees to indemnify and hold the City harmless from any claim involving patent infringement or copyrights on goods supplied.

67. PRE-BID CONFERENCE

The Purchasing Manager shall determine if a Pre-Bid Conference is required and provide the date, time and location in the Solicitation legal advertisement and Solicitation specifications. The conference shall normally be held in the Council Chambers, located on the first floor of City Hall, 1000 City Center Circle, Port Orange, Florida. A site visit may be included and would immediately follow the Pre-Bid Conference. Attendance to the Pre-Bid Conference is normally non-mandatory. The representative of each Bidder shall be an authorized employee of the Bidder and shall sign in accordingly.

68. PREPARATION OF RESPONSES

In preparing Responses, the Proposal Form, the Bid Form (when a Bid Bond is permitted as proposal security), Certificate as to Corporate Principal, Public Entity Crimes Statement, Anti-Collusion Statement, and Drug Free Preference Statement must be properly executed in ink. Upon the prescribed Schedule of Unit Prices, all bid prices shall be typewritten or written in ink, or electronically imputed in the blank spaces for each item, with the amounts extended if a unit

price bid, and all amounts totaled. The sum of the Total Bid as calculated from the individual items, Schedule of Unit Prices, shall equal the Total Price. Except as provided below, bids containing substitutions or combinations of alternates will not be considered unless such substitutions or combinations are specifically authorized by the Proposal. The Bidder shall sign his/her name and give his/her business address in the spaces provided therefore. If the Bid is made as a partnership, it shall be signed by all partners; if made by a corporation, it shall be signed in the name of the corporation by one of the officers thereof and shall have affixed the seal of the corporation.

69. POSTPONEMENT/CANCELLATION/WAIVER OF IRREGULARITIES

The City may, at its sole and absolute discretion, reject any and all, or parts of, Responses; re-advertise the Solicitation for new Responses; postpone or cancel, at any time, the Solicitation process; or waive any irregularities in the Solicitation or in the Responses received as a result of the Solicitation, or to accept that Response which best serves the interest of the City.

70. PRICING

The Bidder certifies that prices, terms and conditions in the Response will be firm for acceptance for a period of ninety (90) days from the date of Response opening unless otherwise stated by the City. Responses may not be withdrawn before the expiration of ninety (90) days. Prices shall be firm, with no escalator clauses unless specified by the City. Responses may be withdrawn after ninety (90) days only upon written notification to the City. Prices for all goods and/or services shall be firm for the duration of this contract and shall be stated on the Pricing/Delivery Information form.

Prices shall be all inclusive: no price changes, additions, or subsequent qualifications will be honored during the course of the contract. All prices must be written in ink or typewritten. Pricing on all transportation, freight, drayage and other charges are to be prepaid by the bidder and included in the bid prices. If there are any additional charges of any kind, other than those mentioned above, specified or unspecified, the Bidder shall indicate the items required and attendant costs or forfeit the right to payment for such items. Where unit pricing and extended pricing differ, unit pricing prevails. In the event of any discrepancy between the written amounts and the numerals, the written amounts shall govern and will be considered as the price bid. When submitting Bids/Proposals based on a Lump Sum basis, Bidders shall be required to submit a Schedule of Unit Pricing for each line item listed on the Bid Proposal in order to be considered for award.

71. PRODUCTS/ESTIMATES

Items included on the Bid Form represent the needs of various departments within the City. This is in no way to be construed as the entire or complete list of products to be purchased from the resulting contract. There is no anticipated dollar volume for this contract and cannot be guaranteed. Items shall be ordered on an as needed, when needed basis. Exact quantities or estimated quantities cannot be predetermined.

72. PROPRIETY INFORMATION

Upon receipt by the City, responses to Solicitations, become public records subject to the provisions Florida's state policy on public records, Section 119, Florida Statutes. If you believe that any portion of your response is exempt, you should clearly identify the specific documents for which confidentiality is claimed and provide specific legal authority of the asserted exemption. Any financial statement that an agency requires a prospective Bidder to submit in order to prequalify for bidding or for responding to a proposal for a road or any other public works project is exempt from Section 119.07, Florida Statutes, and Article I, 24(a), Florida Constitution.

73. PROTECTION

Precaution shall be exercised at all times for the protection of persons, (including employees) and property. All existing structures, utilities, services, roads, trees, shrubbery, etc. shall be protected against damage or interrupted service at all times by the Bidder during the term of contract, and the Bidder shall be held responsible for any damage to the property occurring by reason of his operation on the property.

74. PUBLIC ENTITY CRIMES

In accordance Section 287.133 (2)(a), Florida Statutes: A person or affiliate who has been placed on the convicted bidder list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a bidder, supplier, subcontractor or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided Section 287.017, Florida Statutes, for CATEGORY TWO for a period of 36 Months from the date of being placed on the convicted bidder list.

75. PUBLIC RECORDS COMPLIANCE

Bidder shall comply with public records laws as set forth in Chapter 119, Florida Statutes, and shall specifically:

- (a) Keep and maintain public records required by the City to perform the service.
- (b) Upon request from the City's custodian of public records, provide the City with a copy of the requested record or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Section 119, Florida Statutes, or as otherwise provided by law.
- (c) Ensure that public records that are exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the Contract term and following completion of the Contract if the Bidder does not transfer the records to the City.
- (d) Upon completion of the Contract, Bidder shall transfer to the City, at no cost, all public records in possession of the Bidder and destroy any duplicate public records that are exempt from public records disclosure requirements. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

If Bidder does not comply with a public records request, the City shall deem the non-compliance a breach of this Contract, and the Bidder may be subject to penalties under Section 119.0701, Florida Statutes.

BIDDER QUESTIONS RELATING TO BIDDER'S DUTIES TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT MUST BE FORWARDED TO THE OFFICE OF THE CITY CLERK, CITY HALL, 1000 CITY CENTER CIRCLE, PORT ORANGE, FLORIDA 32129; TELEPHONE: (386) 506-5563; E-MAIL: CITYCLERK@PORT-ORANGE.ORG.

76. PUBLIC RECORDS/PUBLIC MEETINGS EXEMPTION STATEMENT

Section 119.071(1)(c), Florida Statutes: **Any financial statement that an agency requires a prospective Bidder to submit in order to prequalify for bidding or for responding to a proposal for a road or any other public works project is exempt from s. 119.07(1) and s. 24(a), Art. I of the State Constitution. On June 2, 2011, Governor Scott signed HB 7223 into law.** This new legislation amends Florida's Public Records and Sunshine Laws, by expanding "exemptions" applicable to bids, proposals and replies to sealed competitive solicitations, and closes evaluation meetings from the public in certain instances. First, Section 119.071, Florida Statutes was amended to provide that sealed bids, proposals, or replies received by a Florida public agency shall remain exempt from disclosure until an intended decision is announced or until 30 days from the opening, whichever is earlier. This means that Bidders will not be able to procure a copy of their competitor's bids until an intended decision is reached or 30 days has elapsed since the time of the bid opening. The prior version of the law provided for a 10-day exemption. Next, Section 286.0113, Florida Statutes was amended to provide that meetings of persons appointed to evaluate bids or proposals and negotiate contracts shall be closed in certain circumstances. Specifically, portions of such meetings may now be closed to the public during oral presentations made by a bidder, or where a bidder answers questions. In other words, neither Bidders, nor the public will be permitted to sit in on meetings, unless this exemption is waived by the City Council, wherein their competitors are making presentations or discussing their bid or proposal with the committee members. The portions of these meetings must still be recorded and are subject to disclosure at the time of an intended award decision or within 30 days of the bid or proposal opening, whichever is earlier. Portions of the meetings that do not involve presentations, questions and answers, or negotiation strategy or negotiation sessions are still open to the public and competing Bidders, but the new law limits public attendance to portions of such meetings.

77. PURCHASE ORDER AND DELIVERY

The successful Bidder shall not deliver products or provide services without a City of Port Orange Purchase Order, signed by an authorized agent of the City of Port Orange. The fastest, most reasonable delivery time shall be indicated by the Bidder. Any special information concerning delivery should also be included, on a separate sheet, if necessary. All items shall be shipped F.O.B. INSIDE DELIVERY unless otherwise stated in the specifications. This shall be understood to include bringing merchandise to the appropriate room or place designated by the using department. Every tender or delivery of goods must fully comply with all provisions of these requirements and the specifications including time, delivery and quality. Nonconformance shall constitute a breach which shall be rectified prior to expiration of the time for performance. Failure to rectify within the performance period shall be considered cause to reject future deliveries and cancellation of the contract by City of Port Orange without prejudice to other remedies provided by law. Where delivery times are critical, the City of Port Orange reserves the right to award accordingly.

78. QUALITY

All materials used for the manufacture or construction of any supplies, materials or equipment covered by this bid shall be new. The items bid must be new, the latest model, of the best quality and highest-grade workmanship unless otherwise specified in this bid by the City.

79. QUESTIONS, INTERPRETATIONS

Questions regarding interpretation of Responses, Solicitation results or Solicitation awards shall be directed in writing to the Purchasing Division and referenced by the Solicitation number no later than the last day for questions as specified in the Solicitation documents. The City of Port Orange shall not be responsible for oral interpretations given by any City personnel or representative or others. The issuance of a written addendum is the only official method whereby interpretation, clarification or additional information can be given.

80. RECORDS/AUDIT

(a) The Bidder agrees that the City, or any duly authorized representative, shall, until the expiration of five (5) years after final payment hereunder, have access to and the right to examine and copy any pertinent books, documents, papers and records of the Bidder involving transactions related to this Contract.

(b) The Bidder further agrees to include in any subcontract for more than \$10,000 entered into as a result of this Contract, a provision to the effect that the subcontractor agrees that the City or any duly authorized representative shall, until the expiration of five (5) years after final payment under the subcontract, have access to and the right to examine and copy any pertinent books, documents, papers and records of such Bidder involved in transactions related to such subcontract, or this Contract. The term subcontract as used herein shall exclude purchase orders for public utility services at rates established for uniform applicability to the general public.

(c) The period of access provided in subparagraphs (a) and (b) above for records, books, documents and papers which may relate to any arbitration, litigation, or the settlement of claims arising out of the performance of this contract or any subcontract shall continue until any appeals, arbitration, litigation or claims shall have been finally disposed of.

81. RECYCLED MATERIALS

City of Port Orange encourages the use of products made of recycled materials.

82. REJECTING OF RESPONSES, REBIDDING

The City reserves the right to accept or reject any or all Responses or parts of Responses, to waive irregularities and technicalities, and to request re-bids. The City also reserves the right to award the contract on such items the City deems will best serve the interests of the City. The City further reserves the right to award the contract on a "split order" basis, or such combination as shall best serve the interests of the City unless otherwise specified. The City Council shall have the authority to reject any and all Responses. If the lowest and best Response exceeds the budgeted amount and the City Council does not make additional funds available, the Purchasing Agent with the help of the department head shall have the authority to re-advertise the article or articles for bidding after making sufficient changes in the plans or specifications to bring the cost within the limit of the money available. (Code 1981, §8-28.)

83. REQUEST FOR ADDITIONAL INFORMATION

Prior to the final Solicitation selection, Bidders may be required to submit additional information which the City may deem necessary to further evaluate the Bidder's qualifications to perform under the terms of the Solicitation and subsequent Contract.

84. REVIEW OF RESPONSES/SUBMISSIONS

Each Response will be reviewed to determine if the Response is responsive to the submission requirements outlined in the Solicitation. A responsive Response is one which follows the requirements of the Solicitation, includes all required documentation, is submitted in the format outlined in the Solicitation, is of timely submission, and has the appropriate signatures as required on each document. Failure to comply with these requirements may deem your Response non-responsive.

85. RIGHT OF NEGOTIATION

The City reserves the right to negotiate with the selected Bidder the exact terms and conditions of the Contract.

86. RIGHT OF WITHDRAWAL

A bid may not be withdrawn before the expiration of ninety (90) days from the Response due date.

87. RIGHTS TO SOLICITATION SUBMITTED MATERIAL

All Responses, inquiries, or correspondence relating to or in reference to a Solicitation, and all reports, charts, and other documentation submitted by Bidders shall become the property of the City when received.

88. RULES, REGULATIONS AND LICENSING REQUIREMENT

The Bidder shall comply with all laws, ordinances and regulations applicable to the services contemplated herein, including those applicable to conflict of interest and collusion. Bidders are presumed to be familiar with all federal, state and local laws, ordinances, codes and regulations that may in any way affect the services offered.

89. SAMPLES

Samples, when requested, must be furnished at, or before, Response opening, (unless otherwise specified), and will be delivered at no charge to the City. If not used and/or destroyed in testing, said sample(s) will, at the Bidder's request, be returned within thirty (30) days after bid award at the Bidder's expense. If requested by the City, samples and/or inspection of like items are to be made available in the central Florida area.

90. SEPARATION AND DISTRIBUTION

The Solicitation has been designed for transmittal as a complete document to interested parties. It is recommended that it not be separated; however, it may be reproduced in its entirety as additional distribution might dictate.

91. SEVERABILITY

If any section, subsection, paragraph, sentence, clause, phrase or word of these requirements or the specifications shall be held invalid, such holding shall not affect the remaining portions of these requirements and the specifications and it is hereby declared that such remaining portions would have been included in these requirements and the specifications as though the invalid portion had been omitted.

92. SIGNATURE REQUIRED

All Responses must show the company name and be signed by a company officer or employee who has the authority to bind the company or firm by their signature. UNSIGNED RESPONSES WILL BE REJECTED. All manual signatures must be original - no rubber stamp, photocopy, etc.

93. SIGNED RESPONSE CONSIDERED AN OFFER

The signed Response is considered an offer on the part of the Bidder, which offer shall be considered accepted upon approval by the City of Port Orange City Council (if required). The City of Port Orange will issue a purchase order or a letter of authorization to the successful Bidder, as authorization for delivery of the items awarded subject to requirements of detailed specifications and those contained herein. In the event of default on the part of the Bidder after such acceptance, the City may take such action as it deems appropriate including legal action for damages or specific performance.

94. SILENCE OF SPECIFICATIONS

The apparent silence of specifications as to any detail, or the apparent omission from it of a detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and that only material and workmanship of the finest quality are to be used. All interpretations of specifications shall be made on the basis of this statement. The items furnished under this contract shall be new, unused of the latest product in production to commercial trade and shall be of the highest quality as to materials used and workmanship. Manufacturer furnishing these items shall be experienced in design and construction of such items and shall be an established supplier of the item bid.

95. SOLICITATION FORM COMPLETION, SUBMISSION AND RECEIPT OF RESPONSES

Unless otherwise specified, Bidders shall use the Solicitation forms supplied by the Purchasing Division. Responses shall be typewritten or handwritten in ink and shall bear the original signature of the Bidder's authorized representative. Responses containing erasures or corrections must be initialed by the Bidder in ink. Responses shall be submitted by mail or hand delivery only. No Response will be accepted by facsimile transmission, e-mail or other electronic delivery. Responses submitted by mail shall be addressed to: Michael Hall, Purchasing Agent, Purchasing Office, a division of the Finance Department, Port Orange City Hall, 1000 City Center, Port Orange, Florida 32129. Responses submitted by hand delivery shall be delivered to: City Clerk, Port Orange City Hall, 1000 City Center Circle, Port Orange, Florida 32129. Responses will be accepted until 2:30 p.m. on the date indicated in the Solicitation documents or as addenda issued by the City. One (1) sealed envelope or package shall be submitted. The sealed envelope/package must contain the required forms and price proposals, where applicable, and will be evaluated and deemed responsive or non-responsive. All Responses deemed non-responsive will be returned to the Bidder and will not be opened. Bids (Envelope/Package) shall contain one (1) original and one (1) digital (CD or flash drive) version unless otherwise indicated in the legal advertisement and shall be mailed or delivered as set forth in the preceding paragraph in one (1) SEALED ENVELOPE/PACKAGE. The envelope/ package shall be clearly marked on the outside to include the bid project name, bid number and name of the Bidder.

96. STATE LICENSING REQUIREMENTS

All entities defined under Chapters 607, 608, 617 or 620, Florida Statutes, seeking to do business with the City shall be on file and in good standing with the State of Florida's Department of State. Prior to making an offer, the Bidder shall have met the license, certification, and any other requirements of the state, county, city and/or other agency of authority with jurisdiction in such matters and should provide copies of documentation that evidence such qualifications with the response to the Solicitation; and, that the Bidder shall provide follow-up evidence that the Bidder maintains such credentials throughout the period of the agreement. A copy of a current certificate of authority from the Secretary of State authorizing the Bidder/Responder to do business in the State of Florida, or other evidence of legal authority to do business in the state, county, city and/or any other agency of authority should be provided with your response to the Solicitation. Information concerning certification with the Secretary of State may be obtained at <http://ccfcorp.dos.state.fl.us/index.html>. Contract documents shall be executed by the entity's duly authorized officer as evidence by entity records.

97. SUBCONTRACTING

The Bidder will not sub-contract or enter into any subcontracting agreements pertaining to this contract, without obtaining written approval from the City of Port Orange.

98. SUPPLEMENTAL MATERIALS

Bidders are responsible for including all pertinent product data in the returned bid package. Literature, brochures, data sheets, specification information, completed forms requested as part of the bid package and any other facts which may affect the evaluation and subsequent contract award should be included. Materials such as legal documents and contractual agreements that the Bidder wishes to include as a condition of the bid must also be in the returned bid package. Failure to include all necessary and proper supplemental materials may be cause to reject the entire bid.

99. TAXES

The City of Port Orange is exempt from all federal excise, state and local taxes unless otherwise stated in this document. A Tax Exemption Certificate will be furnished upon written request to the City of Port Orange Purchasing Division.

100. TERM CONTRACTS

Acceptance by the City of Port Orange of Bidder's offer shall be limited to the terms herein unless expressly agreed in writing by the City. If the contract is intended to cover a specific time period, the term will be given in the bid specifications.

101. TERMINATION CONVENIENCE – NOTICE

The City of Port Orange reserves the right to terminate the contract for default if the Bidder breaches any of the terms therein, including warranties of the Bidder or if the Bidder becomes insolvent or commits acts of bankruptcy. Such right of termination is in addition to and not in lieu of any other remedies which the City of Port Orange may have in law or equity. Default may be construed as, but not limited to, failure to deliver the proper goods and/or services within the proper amount of time, and/or to properly perform any and all services required to the City's satisfaction and/or to meet all other obligations and requirements. The City may cancel the Contract at any time for breach of contractual obligations by providing the Bidder with a written notice of such cancellation. Should the City exercise its right to cancel the contract for such reasons, the cancellation shall become effective on the date as specified in the notice of cancellation sent to the Bidder.

102. TERMINATION - NOTICE

Either party may cancel the contract at any time after award, unless otherwise specified. The City shall be required to give the bidder notice thirty days prior to the date of cancellation of the contract. The bidder shall be required to give the City written notice (60) sixty days prior to the date of cancellation of the contract. The City of Port Orange may terminate the contract without cause upon thirty (30) days written notice.

103. TITLE TRANSFER

Title and Risk of Loss of goods shall not pass to City of Port Orange until City of Port Orange actually receives and takes possession of the goods at the point or points of delivery. Receiving times may vary with the using department. Generally, deliveries may be made between 8:30 a.m. and 3:00 p.m., Monday through Friday. The Bidder is advised to consult the using department for instructions. The place of delivery shall be specified in the bid specification and/or on the Purchase Order as a "Deliver To:" address.

104. UNBALANCED BID

A mathematically unbalanced bid is where a bidder places a high price on some items and a low price on other items in a unit price contract. A bid is materially unbalanced when there is reasonable doubt that acceptance of a mathematically unbalanced bid will result in the lowest overall cost to the City. Unbalanced Bids will be rejected if the prices are deemed materially unbalanced.

105. USE OF SOLICITATION FORMS

The Bidder shall complete the appropriate Solicitation Form(s) included in the Solicitation. All blanks on the Solicitation Forms shall be completed. If a question or confirmation is not applicable, it should be answered with an "N/A."

Supplemental information may be attached to the Solicitation Forms. Failure to fully complete the appropriate Solicitation Forms may result in disqualification of the Response.

If additional space for a response is required, attach an additional page to the page on which the question is stated. Clearly identify the number of the question to which the response is attached. Further, if additional Solicitation Form pages are needed, photocopy or replicate as appropriate, and attach such additional pages to the page on which the question or chart is stated.

The signature of the Authorized Person or Entity must be that of an officer, partner or a sole proprietor of the entity making the Response. The original Response, and each copy submitted shall contain an original signature on the Bidder's Acknowledgement Form contained in each Solicitation.

106. VARIANCES

For purposes of Response evaluation, Bidders must indicate any variances, no matter how slight, contained in the Response. No variations or exceptions by a Bidder will be considered or deemed a part of the Response submitted unless such variances or exceptions are listed in the Response and referenced in the space provided on the Response pages. If variances are not stated, or referenced as required, it will be assumed that the product or service complies with the City's terms, conditions and specifications. By receiving a Response, the City does not necessarily accept any variances contained in the Response. All variances submitted are subject to review and approval by the City. If any Response contains material variances that, in the City's sole opinion, make that Response conditional in nature, the City reserves the right to reject the Response or part of the Response that is declared, by the City, as conditional.

107. BIDDER'S PRODUCT OR SERVICES

The Bidder's product (if applicable) delivered to the City shall be free of all liens, claims or encumbrances, and the Bidder warrants that it has a clear title to the product being delivered.

- a. If the Bidder is contracted to provide services, such services shall be fully satisfactory to the City as determined by the City.
- b. The Bidder shall provide the City with any data, reports or other information as required and requested by the City to enable it to utilize the product or service furnished by the Bidder.
- c. In furnishing the service or product to the City, the Bidder shall comply with all federal, state, county laws, and city rules, regulations and codes and their successors or amendments. Violation of such laws, rules, regulations and codes may be grounds for delaying or reducing the amount due, or in rescinding the contract, Contract, proposal or quote.

108. WAIVER OF IRREGULARITIES

The City of Port Orange reserves the right to waive and/or reject any non-substantial irregularity in Responses received whenever such waiver or rejection is in the best interest of the City and/or it does not meet the minimum requirements set forth. All reasonably responsive Responses will be considered. However, the City reserves the right to waive formalities or informalities in Responses, to reject, with or without cause, any or all Responses or portions of Responses, or to interview or not interview individual Bidders, and to accept any Responses or portions of Responses deemed to be in the best interest of the City. The City Council shall grant the City Manager to waive any and all non-substantial irregularities in any and all formal Solicitations. (Code 1981, § 8-29; Ord. No. 2015-17, § 1,5-19-2015)

109. WARRANTIES

Bidders shall furnish all data pertinent to warranties or guarantees which may apply to items in the Response. Bidders may not limit or exclude any implied warranties. The Bidder warrants that product sold to the City shall conform to the standards established by the U.S. Department of Labor under the Occupational Safety and Health Act of 1970. In the event product does not conform to OSHA Standards, where applicable, City of Port Orange may return the product for correction or replacement at the Bidder's expense. If the Bidder fails to make the appropriate correction within a reasonable time, City of Port Orange may correct at the Bidder's expense.

[Remainder of this page left intentionally blank]

SECTION 6 – SPECIAL CONDITIONS

PERIOD OF OFFER VALIDITY

Bids offered in this ITB must remain firm for a period of ninety (90) Days from the ITB opening date.

REPAIR OF DAMAGES

It is the Contractor's responsibility to repair any damages incurred in the area that is directly related to the project. When damages occur, the City of Port Orange Representative is to be notified immediately and shall inspect the repairs upon completion.

SAFETY

Contractor shall comply with all applicable OSHA, State of Florida Safety Regulations and comply with all safety requirements of local authorities having jurisdiction. Contractor shall exercise all due caution to exclude the public from the work area and especially from contact with any hazardous materials.

Working hours are 7am-5pm Monday through Friday, a working superintendent must be on site at all time. All debris generated by project is to be removed daily. Disposal of materials will conform to applicable codes and ordinances and placed in licensed landfill or similar disposal site. Existing dumpsters are not to be used by contractor or subs.

SITE CLEANLINESS

The Contractor shall give special attention to keeping the work site clean and free from trash and debris. Trash, debris and waste materials shall not be left on City premises but shall be disposed of at the Contractor's facilities. Site must be maintained free of trash, construction debris and cleaned every day.

CONTRACT TERM

The term of the contract shall be from the notice to proceed. The final completion time will be Three Hundred & Ninety-Five (395) calendar days for final completion.

No changes to subcontractors are allowed without written approval from the City.

TIMELINE

- A. Notice of Award: After bid opening and complete review of submitted bid information.
- B. Notice to Proceed: After Pre-Construction Meeting.
- C. Final Completion Time: Not to exceed Three Hundred & Ninety-Five (395) calendar days maximum from the Notice to Proceed.

ELIGIBILITY OF BIDDER

To be eligible to respond to this ITB, the Bidders must have prior experience working with the services described in this ITB. Please provide eligible experience with your submittal.

NOTICE

The City reserves the right to consider cooperative contracts, federal, state municipal etc.; in the evaluation process. If in the City's best interest, the City may utilize a cooperative contract in lieu of making an award.

LICENSES AND PERMITS

Contractor is responsible for all applicable local and state licenses, permits and fees.

SECTION 7 – REQUIRED FORMS

FORM 7.1 – BID SUBMITTAL CHECKLIST

- _____ Form 7.2 –Bidder’s Acknowledgement Form
- _____ Form 7.3 – Addendum and Change Order Procedure Acknowledgement
- _____ Form 7.4 – Drug Free/Tie Preference Statement
- _____ Form 7.5 – Public Entity Crimes Statement
- _____ Form 7.6 – Affidavit of Anti-Collusion
- _____ Form 7.7 – Statement of Bidder’s Qualifications
- _____ Form 7.8 – Professional References for Previous Experience
- _____ Form 7.9 – Listing of Subcontractors
- _____ Form 7.10 – Certificate as to Corporate Principal
- _____ Form 7.11 – Local Business Affidavit of Eligibility
- _____ Attachment 1 – Bid Proposal
- _____ Copy of License (Florida Certified General Contractor, Sunbiz, etc.)
- _____ Bid Bond
- _____ Submission of one (1) original marked “ORIGINAL” and one (1) digital (CD or flash drive) version in PDF format.

BY: _____
Name of Business

Authorized Signature

Date

This document must be completed and returned with your Submittal

FORM 7.2 – BIDDER’S ACKNOWLEDGEMENT FORM

I have carefully examined the Invitation to Bid (ITB), Instructions to Bidders, General and/or Special Conditions, Specifications, and any other documents accompanying or made a part of this invitation.

I hereby propose to furnish the goods or services specified in the Invitation to Bid at the prices or rates as finally negotiated. I agree that my bid will remain firm for a period of up to ninety (90) days in order to allow the City of Port Orange adequate time to evaluate the proposed bid. Furthermore, I agree to abide by all conditions of the Invitation to Bid.

I certify that all information contained in this Bid is truthful to the best of my knowledge and belief. I further certify that I am a duly authorized to submit this Bid on behalf of the Bidder/Contractor as its act and deed and that the Bidder/ Contractor is ready, willing and able to perform if awarded the contract.

I further certify that this Bid is made without prior understanding, Contract, connection, discussion, or collusion with any person, firm or corporation submitting a Bid for the same product or service; no officer, employee or agent of the City of Port Orange City Council or of any other Bidder interested in said ITB; and that the undersigned executed this Bidder’s Acknowledgement with full knowledge and understanding of the matters therein contained and was duly authorized to do so.

I further certify that having read and examined the specifications and documents for the designated services and understanding the general conditions for contract under which services will be performed, does hereby propose to furnish all labor, equipment, and material to provide the services set forth in the ITB.

I hereby declare that the following listing states any clarifications, any and all variations from and exceptions to the requirements of the specifications and documents. The undersigned further declares that the “work” will be performed in strict accordance with such requirements and understands that any exceptions to the requirements of the specifications and documents may render the Bid non-responsive.

NO EXCEPTIONS ALLOWED AFTER THE BID IS SUBMITTED:

Please check one: ☐ I take NO exceptions. ☐ Exceptions (list below; add additional pages if necessary):

NAME OF BUSINESS

MAILING ADDRESS

AUTHORIZED SIGNATURE

CITY, STATE & ZIP CODE

NAME, TITLE, TYPED

TELEPHONE NUMBER / FAX NUMBER

FEDERAL IDENTIFICATION #

E-MAIL ADDRESS

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me by means of _____ physical presence or _____ online notarization, this _____ day of _____, 20____, by _____, as _____ of _____, a _____ He or she is _____ personally known or _____ produced _____ as identification.

Notary Public, State of _____

Printed, typed or stamped name, commission and expiration:

This document must be completed and returned with your Submittal

FORM 7.3 – ADDENDUM and CHANGE ORDER PROCEDURE ACKNOWLEDGEMENT

ADDENDUM ACKNOWLEDGEMENT

I have carefully examined the Invitation to Bid (ITB), Instructions to Bidders, General and/or Special Conditions, Specifications, and any other documents accompanying or made a part of this invitation to Bid.

I acknowledge receipt and incorporation of the following addenda, and the cost, if any, of such revisions has been included in the price of the bid proposal.

Addendum# _____ Date: _____ Addendum# _____ Date: _____

Addendum# _____ Date: _____ Addendum# _____ Date: _____

CHANGE ORDER PROCEDURE ACKNOWLEDGEMENT

If awarded the Contract for this Solicitation, I acknowledge that no oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders requests shall be made in writing by the Contractor for review by the Contract Administrator for the City of Port Orange. No work shall be performed as set forth in the change order until the Contractor receives an executed Purchase Order for the requested change.

I acknowledge the following statement regarding Change Orders to the awarded Contract:

Name of Business

By: _____

Printed Name: _____

Title: _____

STATE OF _____

COUNTY OF _____

*The foregoing instrument was acknowledged before me by means of _____ physical presence or
_____ online notarization, this _____ day of _____, 20____, by _____ who
is personally known to me or who produced _____ as identification.*

My Commission Expires: _____

Notary Public, State of _____
Printed, typed or stamped name, commission and
expiration:

This document must be completed and returned with your Submittal

FORM 7.4 – DRUG-FREE PREFERENCE STATEMENT

IDENTICAL TIE BIDS - Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids, proposals, statements, or replies that are equal with respect to price, quality, and service are received by the city for the procurement of commodities or contractual services, a bid received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied bidders have a drug-free workplace program.

In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of Section 287.087, Florida Statutes.

As an authorized representative of the firm, I certify that this firm complies fully with the above requirements.

Name of Business

By: _____

Printed Name: _____

Title: _____

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me by means of _____ physical presence or _____ online notarization, this _____ day of _____, 20____, by _____ who is personally known to me or who produced _____ as identification.

My Commission Expires: _____

Notary Public, State of _____

Printed, typed or stamped name, commission and expiration:

This document must be completed and returned with your Submittal

FORM 7.5 – SWORN STATEMENT UNDER SECTION 287.133(3)(A), FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

(To be signed in the presence of notary public or other officer authorized to administer oaths.)

Before me, the undersigned Authority, personally appeared affiant _____, who, being by me first duly sworn, made the following statement:

1. The business address of _____ (name of Offeror or business) is _____.
2. My relationship to _____ (name of Offeror or business) is _____ (relationship such as sole proprietor, partner, president, vice president).
3. I understand that a public entity crime as defined in Section 287.133 of the Florida Statutes includes a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity in Florida or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any proposal or contract for goods or services to be provided to any public entity or such an agency or political subdivision and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.
4. I understand that "convicted" or "conviction" is defined by the Florida Statutes to mean a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilt or nolo contendere.
5. I understand that "affiliate" is defined by the Florida Statutes to mean (1) a predecessor or successor of a person or a corporation convicted of a public entity crime, or (2) an entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime, or (3) those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate, or (4) a person or corporation who knowingly entered into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months.
6. Neither the Offeror or contractor, nor any officer, director, executive, partner, shareholder, employee, member or agent who is active in the management of the Offeror or contractor, nor any affiliate of the Offeror or contractor has been convicted of a public entity crime subsequent to July 1, 1989. (Draw a line through paragraph 6 if paragraph 7 below applies.)
7. There has been a conviction of a public entity crime by the Offeror or contractor, or an officer, director, executive, partner, shareholder, employee, member or agent of the Offeror or contractor who is active in the management of the Offeror or contractor or an affiliate of the Offeror or contractor. A determination has been made pursuant to Section 287.133(3) by order of the Division of Administrative Hearings that it is not in the public interest for the name of the convicted person or affiliate to appear on the convicted bidder list. The name of the convicted person or affiliate is: _____. A copy of the order of the Division of Administrative Hearings is attached to this statement. **(Draw a line through paragraph 7 if paragraph 6 above applies.)**

Name of Business

By: _____

Printed Name: _____

Title: _____

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me by means of _____ physical presence or _____ online notarization, this _____ day of _____, 20____, by _____ who is personally known to me or who produced _____ as identification.

My Commission Expires: _____

Notary Public, State of _____
Printed, typed or stamped name, commission and
expiration:

This document must be completed and returned with your Submittal

FORM 7.6 – ANTI-COLLUSION FORM

ANTI-COLLUSION STATEMENT BID FORM:

By signing this form, the Proposer agrees that this Bid is made without any other understanding, agreement, or connection with any person, corporation, or firm submitting a bid for the same purpose and that the bid is in all respects fair and without collusion or fraud.

SIGN in ink in the space provided below. Unsigned Bids will be considered incomplete, and will be disqualified, and rejected.

IT IS AGREED BY THE UNDERSIGNED BIDDER THAT THE SIGNING AND DELIVERY OF THE BID REPRESENTS THE BIDDERS ACCEPTANCE OF THE TERMS AND CONDITIONS OF THE FOREGOING SPECIFICATIONS, CONTRACT AND PROVISIONS, AND IF AWARDED, THIS CONTRACT WILL REPRESENT THE AGREEMENT BETWEEN THE BIDDERS AND THE CITY OF PORT ORANGE.

NAME OF FIRM: _____

SIGNED BY: _____
(MUST BE SIGNED BY A COMPANY OFFICER OR AUTHORIZED AGENT)

PRINTED SIGNATURE: _____

TITLE: _____

ADDRESS: _____

CITY: __ STATE: _____ ZIP CODE: _____

TELEPHONE: _____ FAX: _____

COMPLETION TIME: _____

F.E.I.N. NUMBER: _____

NO Bid may be withdrawn for a period of ninety (90) days subsequent to the submittal of the Bids, without the consent of the City of Port Orange.

NO BID (REASON): _____

This document must be completed and returned with your Submittal

FORM 7.7 – STATEMENT OF BIDDER’S QUALIFICATIONS

The undersigned warrants that he or she is duly authorized to complete this document, and hereby affirms that the information contained in Form 7.8 is complete, true, and correct to the best of their knowledge and belief. If necessary, questions may be answered on separate paper and attached, with any additional information that may be pertinent.

- A. Name of Bidder.
- B. Permanent main office address.
- C. Date organized.
- D. If a corporation, where incorporated.
- E. How many years have you been engaged in the contracting business under your present firm or trade name?
- F. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion.)
- G. General character of work performed by your company.
- H. Have you ever failed to complete any work awarded to you? If so, where and why?
- I. Have you ever defaulted on a contract? If so, where and why?
- J. List the more important projects recently completed by your company, stating the approximate cost for each and the month and year completed.
- K. List your major equipment currently owned or leased.
- L. Experience in work similar to this type of project.
- M. Background and experience of the principal members of your organization, including the officers.
- N. Credit currently available: \$ _____
- O. Give bank reference: _____
- P. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the Owner?
- Q. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of Bidder's Qualifications.

Name of Business

By: _____

Printed Name: _____

Title: _____

STATE OF _____
COUNTY OF _____

*The foregoing instrument was acknowledged before me by means of _____ physical presence or
_____ online notarization, this _____ day of _____, 20____, by _____ who
is personally known to me or who produced _____ as identification.*

My Commission Expires: _____

Notary Public, State of _____
Printed, typed or stamped name, commission and
expiration:

This document must be completed and returned with your Submittal

FORM 7.8 – PROFESSIONAL REFERENCES FOR PREVIOUS EXPERIENCE

The Bidder proposes that they are qualified to perform the referenced work and has successfully done so on recent projects similar in nature and size. The City reserves the right to check references and confirm information provided herein.

Please provide three (3) current and correct references from clients for similar services.

(Do not include the City of Port Orange)

1. Company Name: _____
Contact Person: _____
City, State: _____
Telephone Number: _____
Email Address: _____
Description of goods or
Services provided: _____
Contract Amount: _____
Start/End Date of Contract: _____
2. Company Name: _____
Contact Person: _____
City, State: _____
Telephone Number: _____
Email Address: _____
Description of goods or
Services provided: _____
Contract Amount: _____
Start/End Date of Contract: _____
3. Company Name: _____
Contact Person: _____
City, State: _____
Telephone Number: _____
Email Address: _____
Description of goods or
Services provided: _____
Contract Amount: _____
Start/End Date of Contract: _____

This document must be completed and returned with your Submittal.

LISTING OF PREVIOUS EXPERIENCE

Commercial Client List

The Bidder proposes that they are qualified to perform the referenced work and has successfully done so on recent projects similar in nature and size. A minimum of three (3) projects must be listed below. The Owner reserves the right to check references and confirm information provided herein.

List clients to whom you currently provide or have in the past provided equal or similar to those required under the City's contract and as outlined in this bid package. A minimum of three (3) projects shall be listed below in order to bid on this contract. The Owner reserves the right to check references and confirm information provided herein.

	Contact Name	Phone	Current Client? Y or N	Number of years service provided	Description of service
1					
2					
3					

This document must be completed and returned with your Submittal.

FORM 7.9 – LISTING OF SUBCONTRACTORS

The Bidder proposes that the following subcontractors are qualified to perform the referenced work and have successfully done so on recent projects similar in nature and size. All subcontractors as referenced in Specifications Section 013300-2.1, I (1) shall be listed. Upon approval of subcontractors listed, the successful **Bidder shall not substitute subcontractors without approval from the City.** Bidder shall attach additional sheets as necessary.

Subcontractor No. 1

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

Subcontractor No. 2

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

Subcontractor No. 3

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

Subcontractor No. 4

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

Subcontractor No. 5

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

This document must be completed and returned with your Submittal

FORM 7.10 – CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the _____ secretary of the corporation named as Principal in the within Bid Bond; that _____, who signed the said Bid Bond on behalf of the Principal, was then of said corporation; that I know his signature, and his signature thereto is genuine; and that said Bid Bond was duly signed, sealed and attested for in behalf of said corporation by authority of its governing body.

Signature

AFFIX CORPORATE SEAL

This document must be completed and returned with your Submittal

FORM 7.11 - LOCAL BUSINESS AFFIDAVIT OF ELIGIBILITY

City of Port Orange

*This declaration is executed under penalty of perjury of the laws to the United States and State of Florida***THIS AFFIDAVIT IS SUBMITTED IN REFERENCE TO THE FOLLOWING SOLICITATION:**

RFSQ/RFP/ITN/BID/CONTRACT/PROJECT #(as applicable): _____

BUSINESS NAME: _____ CONTACT PERSON/TITLE: _____ MAILING ADDRESS: _____

CITY-STATE-ZIP: _____ Length of Time at Address Provided: _____

Physical Presence of Business: ☐ Headquarters, ☐ Manufacturing Facility, or ☐ Locally Owned FranchiseAnd within Legal Boundaries: ☐ The City of Port Orange ☐ Volusia County ☐ The State of

Florida FEIN (Federal Employer Identification Number): _____

BUSINESS STRUCTURE: ☐ Corporation ☐ LLC ☐ Partnership ☐ Sole Proprietorship☐ Other (Specify): _____

PHONE NUMBER: _____ FAX: _____

EMAIL: _____

****Please attach a valid business tax receipt, or other such documentation****

ATTESTATION – I understand that:

- In accordance with City Of Port Orange City Code 2-275, local businesses shall have five (5) business days from bid/proposal opening to submit a best and final bid for evaluation. To qualify: A Port Orange business initial bid must be within (8%) of the lowest and best responsible bid from a non-Port Orange business; A Volusia County business initial bid must be within (5%) of the lowest and best responsible bid from a non-Volusia County business; A State of Florida business initial bid must be within (3%) of the lowest and best responsible bid from a non-State of Florida business.
- A local business must have its headquarters, manufacturing facility, or locally owned franchise located within the legal boundaries of the City of Port Orange, Volusia County, or the State of Florida, as indicated herein, for at least twelve (12) months prior to the bid or proposal opening date and a valid business license, issued by the corresponding government agency. Post office boxes are not verifiable and shall not be used for the purpose of establishing said physical address. Bidders shall attach to this affidavit of eligibility with a bid or proposal, a copy of a valid business tax receipt or such other documentation, to the city's satisfaction, demonstrating the physical business presence of the firm within corresponding local limits.
- The preference does not apply to goods or services exempted by statute or prohibited by Federal law, State law, or other funding source restrictions.
- The preference established in this policy does not prohibit the right of the City, or other authorized purchasing authority, to compare quality or fitness for use of supplies, materials, equipment and services proposed for purchase and compare qualifications, character, responsibility and fitness of all persons, firms or corporations submitting bids or proposals.
- The information contained herein may be subject to verification.
- A bidder who misrepresents the local preference status of its firm in a proposal or bid submitted to the City of Port Orange will lose the privilege to claim local preference status, and shall lose eligibility to claim local preference for a period of one (1) year. The City Manager may also recommend that the firm be referred for debarment.

As an authorized representative of the firm, I certify that this firm complies fully with the above requirements.

Name of Business

By: _____

Printed Name: _____

Title: _____

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me by means of _____ physical presence or _____ online notarization, this _____ day of _____, 20____, by _____, as _____ of _____, a _____. He or she is _____ personally known or _____ produced _____ as identification.

Notary Public, State of _____

Printed, typed or stamped name, commission and expiration:

BID COST/FEE PROPOSAL**"ATTACHMENT 1" ITB 21-13 SCHEDULE OF UNIT PRICING****BID FORM****CITY OF PORT ORANGE****ITB 21-13 Renovation and Expansion of The REC**Completed Attachment 1 Bid Proposal form **MUST** be included with Bid Submission

Instruction to save Attachment from Demandstar website:

Perform "File Save As" and save spreadsheet to your computer. Fill in pricing in the highlighted cells electronically.

Bidders are required to complete all fields shaded in green. All other fields will be automatically calculated, if submitted electronically.**NAME OF BUSINESS:****CONTACT PERSON:****EMAIL ADDRESS:****AUTHORIZED SIGNATURE:**

ITEM #	DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	EXTENDED COST
1	Mobilization	1	LS	\$ -	\$ -
2	Demolition	1	LS	\$ -	\$ -
3	General Construction	1	LS	\$ -	\$ -
<i>Schedule of Additive Alternates</i>					
1	Alt No. 1: Remove & Replace Existing ACU/AHU Equipment in Gym #1	1	LS	\$ -	\$ -
2	Alt No. 2: Provide Welded Extruded Walkway Cover & Foundation	1	LS	\$ -	\$ -
3	Alt No. 3: Provide U.V. Filtration System in the new HVAC Systems	1	LS	\$ -	\$ -
4	Alt No. 4: Provide Automatic Hands-Free Flush Valves on Urinals & Water Closets, Automatic Hands-Free Soap & Paper Towel Dispensers	1	LS	\$ -	\$ -
5	Alt No. 5: Provide Indoor Play-Structure	1	LS	\$ -	\$ -
				Additive Alternates Subtotal	\$ -
				TOTAL BID	\$ -
Confirm the number of calendar days to complete upon receipt of PO:				_____	Days
Shall warrant all materials, labor and workmanship for the minimum period of:				_____	Years
AWARD: THIS BID WILL BE AWARDED TO THE LOWEST, RESPONSIVE, RESPONSIBLE BIDDER					

This document must be completed and returned with your Submittal

BID BOND

BID BOND

Bond No.:

KNOW ALL MEN BY THESE PRESENTS that _____, as Contractor, duly authorized to conduct business in the State of Florida, whose principal place of business is located at _____, Tel.: _____, (hereinafter called "PRINCIPAL"), and _____, as SURETY, duly authorized to conduct business in the State of Florida, whose principal place of business is located at _____, Tel.: _____ (hereinafter called "SURETY"), are held and firmly bound unto the City of Port Orange, Florida, as CITY, a Florida municipal corporation, whose address is City of Port Orange, 1000 City Center Circle, Port Orange, Florida 32129, Tel.: (386) 506-5501, (hereinafter called "OBLIGEE" or "CITY"), in the penal sum of _____ dollars and (____)/100 (\$____), lawful money of the United States, for the payment of which sum shall and truly be made, whereof PRINCIPAL and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that, whereas the Principal has submitted the accompanying bid, dated _____, 20____, for:

Project Name / Bid No.:

Project Address:

Legal Description:

Description of Work:

NOW, THEREFORE,

A. If the principal shall not withdraw said bid within one hundred twenty (120) days after date of opening of the same, and shall within ten (10) days after the prescribed forms are presented to it for signature, enter into a written contract with the City in accordance with the bid as accepted, and give bonds with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract, then the above obligations shall be void and of no effect, otherwise to remain in full force and virtue.

B. In the event of the withdrawal of said bid within the period specified, or the failure to enter into such contract and give such bonds within the time specified, if the principal shall pay the City the difference between the amount specified in said bid and the amount for which the City may procure the required work and supplies, if the latter amount be in excess of the former, then the above obligations shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above parties have executed this instrument under their several seals, this _____ day of _____, A.D. 20____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Note: If the firm is a sole ownership or partnership including limited liability company, two (2) witnesses are required to attest the signature. If the firm is a corporation, then the corporate secretary shall attest and affix the corporate seal (Attach power of attorney to original bid bond and financial statement of Surety Company).

PRINCIPAL:

Signature

Corporate Officer & Title

ATTEST:

Signature

Corporate Secretary (Affix Corporate Seal)

WITNESSES:

SURETY:

Attorney-in-Fact (signature)

Name & Title

Name of Local Resident Agent

City, State, Zip

Telephone:
A.M. Best No.: _____ NAIC No. : _____

ATTEST:

Signature

Corporate Secretary (Affix Corporate Seal)

STATE OF _____
COUNTY OF _____

Before me this day personally appeared _____ (affiant), who, being duly sworn, deposes and says that he/she is the Attorney-in-Fact for the _____ (corporate surety) and that this person has been authorized by _____ (corporate surety) to execute the forgoing bond on behalf of the Contractor named therein in favor of the City of Port Orange, Florida.

Signature of Affiant

Sworn to / Affirmed and subscribed before me this _____ day of _____, 20____, by _____, who is personally known to me or who produced _____ as identification.

NOTARY PUBLIC – STATE OF

Type or print name: _____

Commission No.: _____

Commission Expires: _____

(Seal)

.....
END OF BID BOND

This document must be completed and returned with your Submittal

PAYMENT & PERFORMANCE BOND

RETURN RECORDED DOCUMENT TO:

City Clerk
1000 City Center Circle
Port Orange, Florida 32129-4144

Name of Project

City Project No. _____

Bond No. _____

Space Reserved for Recording Data

**COMBINATION PAYMENT AND PERFORMANCE BOND
FOR
PUBLIC CONSTRUCTION**

*per Section 255.05, Florida Statutes
Guaranty for Construction of Public Improvements*

BY THIS BOND, We, _____ as Principal, and _____, a corporation, as Surety, are bound to **CITY OF PORT ORANGE, FLORIDA**, a Florida municipal corporation, herein called "Owner" or sometimes referred to as "City," in the sum of _____ **DOLLARS** (\$ _____), for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the terms of that certain _____ having an effective date of _____, entered into by and between the Principal and the City, for _____, hereinafter referred to as the "Contract," being made a part of this bond by reference, at the times and in the manner prescribed in the Contract; and
2. Promptly makes payments to all claimants, as defined in Section 255.05(1), Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the Contract (the "Work"); and
3. Pays Owner all losses, damages, delay damages (including contractually authorized liquidated damages), expenses, costs, and attorney's fees, including appellate proceedings, that Owner sustains because of a breach or material breach by Principal under the Contract documents; and
4. Performs the guarantee of all work and materials furnished under the Contract for the time specified in the Contract, then this bond is void; otherwise it remains in full force.

Notice of Nonpayment and Time Limitations

Any action instituted by a claimant under this bond for payment must be in accordance with the notice and time limitation provisions in Sections 255.02(2), (8) and (10), Florida Statutes.

Any changes in or under the contract documents and compliance or noncompliance with any formalities connected with the contract or the changes does not affect Surety's obligation under this bond.

(Capital Projects)
[MTR/sal 2016-02-26]

Page 1 of 2
Public Construction Bond

IN WITNESS WHEREOF, this performance and payment bond is executed in duplicate originals, each of which shall be deemed an original, this _____, day of _____, 20__.

Attest:

(Name of Principal)

(As to Corporate Principal) Secretary

By: _____

Name/Title: _____

(Witness to Principal)

(Corporate Seal)

(Surety)

(Witness to Surety)

By: _____

Name: _____

(Attorney-in-Fact)

(Corporate Seal)

NOTE: **Date of BOND must not be prior to date of Contract.** If Developer/Principal is Partnership, all partners should execute BOND. All BONDS signed by an agent must be accompanied by a certified copy of the authority to act.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Florida.

County of Volusia ECHO Grants-in-Aid Agreement

WHEREAS, the voters of Volusia County overwhelmingly approved the Volusia ECHO ballot initiative, as outlined in Resolution 2000-156, and affirmed their desire to have a long-term development program that funds projects that enhance the quality of life in Volusia County by ensuring the availability of environmental, cultural, historical, and outdoor recreational opportunities, and

WHEREAS, Resolution 2000-156 sets forth objectives, criteria, and procedures for implementation of the Volusia ECHO Program, and

WHEREAS, the County of Volusia Community Services Department has budgeted funds for eligible ECHO projects, and

WHEREAS, the County of Volusia has determined that Project No. 19-11, a project of the City of Port Orange, is eligible for Volusia ECHO funding.

AGREEMENT

The County of Volusia, 123 W. Indiana Avenue, DeLand, Florida (hereinafter referred to as the "County"), and in the County of Volusia (hereinafter referred to as "Grantee"), agree as follows:

1. Within the 2018-2019 grant cycle, the County of Volusia shall designate funds not to exceed \$400,000.00, to be held for the Grantee, for the performance of items approved for funding which are described and attached hereto as "Exhibit A", (Grantee's application), and any other requirement made a part of this agreement.
2. The funds will be made available to the Grantee on a 1:1 match basis as detailed in "Exhibit A" and expenditures reimbursed on a quarterly basis, unless otherwise agreed upon by the County, only if the Grantee has maintained all grant requirements and upon the Grantee providing:
 - A Quarterly Project Report and a Reimbursement Request Form with backup documentation (Exhibit B - explaining encumbrances and expenditures and project status report).
 - Not for Profit Organizations shall provide Release of Liens.
3. Ten (10) percent of the grant funds will be withheld until the total project and final reports are completed as described in "Exhibit C" (ECHO application guide).
4. It is understood between the parties that the amount of funds designated in paragraph 1 above is the maximum amount the County will provide and the County shall only pay eligible expended costs, as they are concurrently matched 1:1 by the applicant, unless otherwise approved by the County.
5. The expiration date of this grant will be exactly 730 days after the execution of this agreement unless the County grants an extension as provided for in the grant application guide (Exhibit C). The ECHO funds and all cash match must be encumbered within the initial 365 days following the execution of this grant agreement but final payments for services and completion of the project construction may be extended up to another 365-day period. Extensions beyond the 730-day period may restrict the Grantee or any other organization from applying for additional ECHO grants for this project or phase of this project until this current grant agreement is concluded. To be considered for an extension, a written request must be sent to the Parks, Recreation and Culture ECHO Program Coordinator prior to sixty days of the grant agreement expiration date and must state the reasons for the request and provide a new completion date. The County will notify the Grantee in writing within thirty days of receipt of the request for extension approving or denying said request.

6. The Grantee agrees to conduct the project according to the plans and specifications provided in "Exhibit A." All major deviations and/or major changes in scope or venue must receive prior written approval of the County Council and may result in the revocation of this grant. Minor changes may be approved through the ECHO Program Coordinator. Such approval shall not be unreasonably withheld.
7. Understand that this is an annual grant of money only and that this agreement does not obligate the County to provide additional funds for the project or to be responsible for the completion of the project or the operation and maintenance of the project before or after the project is completed.
8. Grantee fully understands its obligation to maintain the facility in clean working order and maintain and/or replace equipment, furnishings, and items described in this grant and/or purchased as part of this grant project for the public use as described in the application. This project shall remain open and in operation as set forth in exhibit A for a period of 30 years.
9. The Grantee fully understands that there will be no reimbursement for obligations or expenditures made prior to the execution of this agreement or after the agreement has ended unless the project is a Historic Reimbursement Grant.
10. The Grantee shall provide all additional monies necessary to complete the project according to "Exhibit A" which shall include competent evidence, prior to the signing of the agreement, of its ability to complete the project. The Grantee shall have all matching funds on deposit in its account or valid contracts for grants from other entities prior to proceeding with the ECHO project. Grantee shall furnish the County with evidence of the matching funds in order to receive a Notice to Proceed. Grantee shall not encumber any ECHO project funds without a Notice to Proceed.
11. To the extent allowed by law, the Grantee agrees to hold the County harmless from any and all claims, liabilities, rights, and obligations arising out of the development and operation of this project as described in "Exhibit A."
12. Signage showing the County of Volusia involvement is required:
 - a. Within 90 days of award, one (1) 4' x 8' exterior sign shall be placed in a prominent public location. See "Exhibit D" for design and wording.
 - b. Upon completion of the project, one (1) permanent 8 sq. ft. sign shall be placed on site in a prominent public location. See "Exhibit E" for design, wording, and material.

Note: Alternative signage and/or appropriate material may be considered when the need or reasonableness for the alternative sign is proven. A written request with a drawing to scale of the proposed changes must be sent to the ECHO Program Coordinator for approval. The ECHO Program Coordinator will respond in writing within 14 days after receipt of the Grantee's written request.
13. The Grantee shall provide a program report annually over the agreement period in a format directed by the County.
14. The Grantee agrees to be bound to special conditions to the grant attached hereto and made a part of this agreement as "Exhibit F," the Restrictive Covenants.
15. The Grantee agrees to provide a payment and performance bond, naming the County of Volusia as co-obligee, for all contracted work prior to expenditure of ECHO funds. All work performed prior to receiving proof of the bond may be determined by the County as ineligible for reimbursement.
16. The Grantee agrees to be responsible for and comply with all local, State, and Federal permits and laws.
17. The Grantee agrees that failure to comply with this agreement, and all attached documents which are part of this agreement, may result in the Grantee repaying the grant funds, in part or whole, to

the County. In addition, the Grantee agrees that failure to comply with all requirements may result in its being denied future grant funds for other projects under the ECHO grant program.

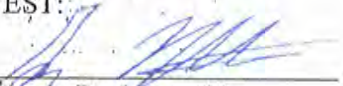
18. Trails and projects on public lands not owned by the applicant: In lieu of the Restrictive Covenants and unrestricted ownership, for trails projects that are part of the County's Trails Master Plan approved by the County Council or projects on State and Federal lands, the public right of continuing access and undisturbed use shall be provided by a Use Permit, Land Management Agreement, or Project Management Agreement to which the applicant is party. If the Agreement is dissolved prior to the end of the time period stated in the Agreement that is included as part of the ECHO Grant Agreement or the project is deconstructed or no longer available for public use for the time period required based on the type of project (section 1.5, 2 in the ECHO Guide), the grantee shall repay the County in the manner set forth in the Restrictive Covenants, as shown in section 1.6 of the ECHO Application Guide, section 3.

By their hands and seals, the duly authorized officers or representatives of these respective parties execute this document this 19th day of March.

COUNTY COUNCIL
VOLUSIA COUNTY, FLORIDA

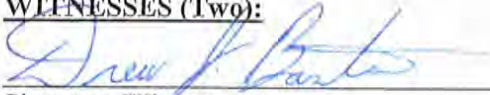
By: 
Edward Kelley
County Chair

ATTEST:

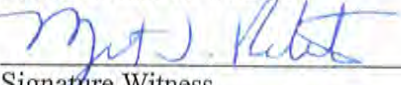
By: 
George Recktenwald
County Manager

GRANTEE SIGNATURES

WITNESSES (Two):


Signature Witness

Drew J. Bastian
Printed Name of Witness


Signature Witness

Margaret T. Roberts
Printed Name of Witness

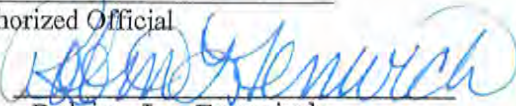
GRANTEE

City of Port Orange
Name of Organization


Signature Authorized Official

Donald O. Burnette
Printed Name of Authorized Official

Mayor
Title of Authorized Official

ATTEST: 
Robin L. Fenwick
City Clerk



Community Services
www.volusia.org

May 18, 2020

Amanda Lasecki, Grants Manager
City of Port Orange
1000 City Center Circle
Port Orange 32129

**RE: ECHO Grant Award 20-10
REC Center Phase II**

Dear Ms. Lasecki,

Having received a copy of the Restrictive Covenants and all of the current required documents, we are issuing this letter to you, which serve as the official Notice-To-Proceed for ECHO grant project **20-10 City of Port Orange, REC Center Phase II**. **Before beginning construction**, the following items are required:

- Bid documentation showing names of companies, prices, and selected vendors.
- Final Design Drawings, if revised from application.
- A Performance Bond naming the County of Volusia as Co-obligee (amount = ECHO & match installation value).
- Documentation of the encumbrance of funds associated with this project.

You are required to file quarterly project status reports and reimbursement requests (even if there is no construction activity or reimbursements requested) as stated in item 2 of the ECHO Grants-In-Aid Agreement and in the format as indicated in Exhibit B of the Agreement. After the total reimbursement has been made to you, only an annual report will be required to provide information relative to use of the facility. Please be sure to provide your grant number **20-10** on all reports. Forms for the quarterly reports will be emailed to you prior to the end of the quarter. The following is the schedule for the first year quarterly project development reports and reimbursement requests unless otherwise advised:

123 West Indiana Avenue, Room 100 • Deland, FL 32720 Tel:
386-943-7029 • FAX: 386-740-5101

www.volusia.org

REPORT PERIOD	DUE DATE
July 1 – Sept 30	October 15
Oct. 1 – Dec. 31	January 15
Jan. 1 – March 31	April 15
April 1 – June 30	July 15

It is critical that we receive your reports/requests in our office by the above deadlines as it will ensure a smooth reimbursement process, provide timely feedback on your progress to the County Council and the ECHO Advisory Committee, and will establish your ability to administer this grant or grants that you may apply for in the future.

On behalf of the ECHO staff, I want to again congratulate you on your grant award. We look forward to working with you to ensure the successful completion of this project to realize the goals of the ECHO Program. Please contact me at (386) 736-7029 or chall@volusia.org if you have further questions.

Sincerely,



Carmen Hall, Director
Community Assistance Division

FILE: 20-10

County of Volusia ECHO Grants-in-Aid Agreement

WHEREAS, the voters of Volusia County overwhelmingly approved the Volusia ECHO ballot initiative, as outlined in Resolution 2000-156, and affirmed their desire to have a long-term development program that funds projects that enhance the quality of life in Volusia County by ensuring the availability of environmental, cultural, historical, and outdoor recreational opportunities, and

WHEREAS, Resolution 2000-156 sets forth objectives, criteria, and procedures for implementation of the Volusia ECHO Program, and

WHEREAS, the County of Volusia Community Services Department has budgeted funds for eligible ECHO projects, and

WHEREAS, the County of Volusia has determined that Project No.-20-10, a project of the City of Port Orange, is eligible for Volusia ECHO funding.

AGREEMENT

The County of Volusia, 123 W. Indiana Avenue, DeLand, Florida (hereinafter referred to as the "County"), and in the County of Volusia (hereinafter referred to as "Grantee"), agree as follows:

1. Within the 2019-2020 grant cycle, the County of Volusia shall designate funds not to exceed \$400,000.00, to be held for the Grantee, for the performance of items approved for funding which are described and attached hereto as "Exhibit A", (Grantee's application), and any other requirement made a part of this agreement.
2. The funds will be made available to the Grantee on a 1:1 match basis as detailed in "Exhibit A" and expenditures reimbursed on a quarterly basis, unless otherwise agreed upon by the County, only if the Grantee has maintained all grant requirements and upon the Grantee providing:
 - A Quarterly Project Report and a Reimbursement Request Form with backup documentation (Exhibit B - explaining encumbrances and expenditures and project status report).
 - Not for Profit Organizations shall provide Release of Liens.
3. Ten (10) percent of the grant funds will be withheld until the total project and final reports are completed as described in "Exhibit C" (ECHO application guide).
4. It is understood between the parties that the amount of funds designated in paragraph 1 above is the maximum amount the County will provide and the County shall only pay eligible expended costs, as they are concurrently matched 1:1 by the applicant, unless otherwise approved by the County.
5. The expiration date of this grant will be exactly 730 days after the execution of this agreement unless the County grants an extension as provided for in the grant application guide (Exhibit C). The ECHO funds and all cash match must be encumbered within the initial 365 days following the execution of this grant agreement but final payments for services and completion of the project construction may be extended up to another 365-day period. Extensions beyond the 730-day period may restrict the Grantee or any other organization from applying for additional ECHO grants for this project or phase of this project until this current grant agreement is concluded. To be considered for an extension, a written request must be sent to the ECHO Program Coordinator prior to sixty days of the grant agreement expiration date and must state the reasons for the request and provide a new completion date. The County will notify the Grantee in writing within thirty days of receipt of the request for extension approving or denying said request.

6. The Grantee agrees to conduct the project according to the plans and specifications provided in "Exhibit A." All major deviations and/or major changes in scope or venue must receive prior written approval of the County Council and may result in the revocation of this grant. Minor changes may be approved through the ECHO Program Coordinator. Such approval shall not be unreasonably withheld.
7. Understand that this is an annual grant of money only and that this agreement does not obligate the County to provide additional funds for the project or to be responsible for the completion of the project or the operation and maintenance of the project before or after the project is completed.
8. Grantee fully understands its obligation to maintain the facility in clean working order and maintain and/or replace equipment, furnishings, and items described in this grant and/or purchased as part of this grant project for the public use as described in the application. This project shall remain open and in operation as set forth in exhibit A for a period of 40 years.
9. The Grantee fully understands that there will be no reimbursement for obligations or expenditures made prior to the execution of this agreement or after the agreement has ended unless the project is a Historic Reimbursement Grant.
10. The Grantee shall provide all additional monies necessary to complete the project according to "Exhibit A" which shall include competent evidence, prior to the signing of the agreement, of its ability to complete the project. The Grantee shall have all matching funds on deposit in its account or valid contracts for grants from other entities prior to proceeding with the ECHO project. Grantee shall furnish the County with evidence of the matching funds in order to receive a Notice to Proceed. Grantee shall not encumber any ECHO project funds without a Notice to Proceed.
11. To the extent allowed by law, the Grantee agrees to hold the County harmless from any and all claims, liabilities, rights, and obligations arising out of the development and operation of this project as described in "Exhibit A."
12. Signage showing the County of Volusia involvement is required:
 - a. Within 90 days of award, one (1) 4' x 8' exterior sign shall be placed in a prominent public location. See "Exhibit D" for design and wording.
 - b. Upon completion of the project, one (1) permanent 8 sq. ft. sign shall be placed on site in a prominent public location. See "Exhibit E" for design, wording, and material.Note: Alternative signage and/or appropriate material may be considered when the need or reasonableness for the alternative sign is proven. A written request with a drawing to scale of the proposed changes must be sent to the ECHO Program Coordinator for approval. The ECHO Program Coordinator will respond in writing within 14 days after receipt of the Grantee's written request.
13. The Grantee shall provide a program report annually over the agreement period in a format directed by the County.
14. The Grantee agrees to be bound to special conditions to the grant attached hereto and made a part of this agreement as "Exhibit F," the Restrictive Covenants.
15. The Grantee agrees to provide a payment and performance bond, naming the County of Volusia as co-obligee, for all contracted work prior to expenditure of ECHO funds. All work performed prior to receiving proof of the bond may be determined by the County as ineligible for reimbursement.
16. The Grantee agrees to be responsible for and comply with all local, State, and Federal permits and laws.
17. The Grantee agrees that failure to comply with this agreement, and all attached documents which are part of this agreement, may result in the Grantee repaying the grant funds, in part or whole, to

the County. In addition, the Grantee agrees that failure to comply with all requirements may result in its being denied future grant funds for other projects under the ECHO grant program.

18. Trails and projects on public lands not owned by the applicant: In lieu of the Restrictive Covenants and unrestricted ownership, for trails projects that are part of the County's Trails Master Plan approved by the County Council or projects on State and Federal lands, the public right of continuing access and undisturbed use shall be provided by a Use Permit, Land Management Agreement, or Project Management Agreement to which the applicant is party. If the Agreement is dissolved prior to the end of the time period stated in the Agreement that is included as part of the ECHO Grant Agreement or the project is deconstructed or no longer available for public use for the time period required based on the type of project (section 1.5, 2 in the ECHO Guide), the grantee shall repay the County in the manner set forth in the Restrictive Covenants, as shown in section 1.6 of the ECHO Application Guide, section 3.

By their hands and seals, the duly authorized officers or representatives of these respective parties execute this document this 3rd day of March, 2020.

COUNTY COUNCIL
VOLUSIA COUNTY, FLORIDA

By: Edward Kelley
Edward Kelley
County Chair

ATTEST:

By: George Recktenwald
George Recktenwald
County Manager

GRANTEE SIGNATURES

WITNESSES (Two):

Robin Fenwick
Signature Witness

Robin Fenwick
Printed Name of Witness

Shannon K. Balmer
Signature Witness

Shannon K. Balmer
Printed Name of Witness

GRANTEE

City of Port Orange

Name of Organization

Donald O. Burnette
Signature Authorized Official

Donald O. Burnette
Printed Name of Authorized Official

Mayor
Title of Authorized Official

AFFIDAVIT REGARDING WORKERS' COMPENSATION

IMPORTANT

This certificate must be completed and returned by the Awarded Bidder, upon issuance of a Notice of Intent to Award by the Purchasing Department of the City of Port Orange. Please note, the City of Port Orange does not accept exemptions for Workers' Compensation coverage.

State of _____

County of _____

I, _____, being duly sworn according to law, deposes and says (it, he, she, they) have accepted the Workers' Compensation laws of the State of Florida, with its supplements and amendments and has insured (its, his, her, their) liability there under accordance with the terms of said Laws with the _____ Company, under the terms of Policy Number _____ for a period from _____, 20__ to _____, 20__.

WITNESS:

By: _____

Name: _____

CONTRACTOR:

Company: _____

By: _____

Name/Title: _____

Sworn to and subscribed before me this _____ day of _____, 20__.

My Commission Expires: _____

Notary Public

Notary Public Printed Name

This certificate must be completed and returned by the Awarded Bidder, upon issuance of a Notice of Intent to Award by the Purchasing Department of the City of Port Orange. Please note, the City of Port Orange does not accept exemptions for Workers' Compensation coverage.

LEASED EMPLOYEE AFFIDAVIT

EXHIBIT CONTRACT # _____

☐ I hereby certify that I do not utilize an employee leasing company or employee leased employees. I further agree to notify the City in the event these circumstances change.

OR

☐ I affirm that an employee leasing company provides my workers' compensation coverage. I further understand that my contract with the employee leasing company limits my workers' compensation coverage to enrolled worksite employees only. My leasing arrangement does not cover un-enrolled worksite employees, independent contractors, uninsured sub-contractors or casual laborexposure.

I hereby certify that 100% of my workers are covered as worksite employees with the employee leasing company. I certify that I do not hire any casual or uninsured labor outside the employee leasing arrangement. I agree to notify the City in the event that I have any workers not covered by the employee leasing workers' compensation policy. In the event that I have any workers not subject to the employee leasing arrangement, I agree to obtain a separate workers' compensation policy to cover these workers. I further agree to provide the City with a certificate of insurance providing proof of workers' compensation coverage prior to these workers entering any Cityjobsite.

I further agree to notify the City if my employee leasing arrangement terminates with the employee leasing company and I understand that I am required to furnish proof of replacement workers' compensation coverage prior to the termination of the employee leasing arrangement.

I certify that I have workers' compensation coverage for all of my workers through the employee leasing arrangement specified below:

Name of Employee Leasing Company: _____

Workers' Compensation Carrier: _____

A.M. Best Rating of Carrier: _____

Inception Date of Leasing Arrangement: _____

I further agree to notify the City in the event that I switch employee-leasing companies. I recognize that I have an obligation to supply an updated workers' compensation certificate to the City that documents the change of carrier.

I hereby attest that the information provided in this affidavit is accurate. In addition, I certify that I have read and understand the above statements regarding my responsibility under the Workers' Compensation coverage.

Name of Contractor: _____

Signature of Owner/Officer: _____

Title: _____ Date: _____

DRAFT AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

«CITY OF PORT ORANGE»«»
««1000 City Center Circle»
««Port Orange, FL 32129»
«»

and the Contractor:
(Name, legal status, address and other information)

« »«»
« »
« »
« »

for the following Project:
(Name, location and detailed description)

«ITB 21-13 Rec Remodel and Expansion»
« »
«Renovation and expansion of the Rec»

The Architect:
(Name, legal status, address and other information)

««DJ DESIGNS»«»
««913 North Nova Road»
««Holly Hill, FL 32117»
« »

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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TABLE OF ARTICLES

1	THE CONTRACT DOCUMENTS
2	THE WORK OF THIS CONTRACT
3	DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
4	CONTRACT SUM
5	PAYMENTS
6	DISPUTE RESOLUTION
7	TERMINATION OR SUSPENSION
8	MISCELLANEOUS PROVISIONS
9	ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

☐ The date of this Agreement.

☒ A date set forth in a notice to proceed issued by the Owner.

☐ Established as follows:

(Insert a date or a means to determine the date of commencement of the Work.)

« »

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

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[« »] Not later than « » (« ») calendar days from the date of commencement of the Work.

[« X »] By the following date: « Contractor shall achieve Substantial Completion of the work not later than 150 days from the issuance of a written Notice to Proceed by the City, and Final Completion 30 days thereafter. »

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be « » (\$ « »), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

«-«\$500.00 per day.»

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

« »

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ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 ~~Contractor shall provide to the Owner fully executed Waiver and Partial Release from Contractor, Waiver and Partial Releases from Contractor's Subcontractors, Sub-subcontractor, suppliers, and materialmen or any party with lien rights, and Contractor's Affidavit of Outstanding Accounts at the time each Application for Payment is submitted. Based upon Applications for Payment submitted to the Architect by the Contractor in the form attached as Exhibit "D" and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents. Copies of the required Waiver and Partial Release from Contractor, Waiver and Partial Releases from Contractor's Subcontractors, Sub-subcontractors, suppliers and materialmen or any party with lien rights, and Contractor's Affidavit of Outstanding Accounts are attached as Composite Exhibit "E."~~

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the « 1st » day of a month, ~~the Owner shall make payment of the amount certified to, and the Contractor obtains Architect's certification of the application for payment within 10 days thereafter, then the Owner shall make payment of the amount certified to the Contractor not later than the « 10th » day of the « following » month. If an Application for Payment is received by the Architect after the application date fixed above, and the Contractor obtains Architect's certification of the application for payment within 10 days thereafter, then payment of the amount certified shall be made by the Owner not later than « 30 » (« ») days after the Architect receives the Application for Payment.~~
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule, ~~unless objected to by the Architect, of values~~ shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™-2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201-2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201-2017; and

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.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

«Five percent (5%)»

§ 5.1.7.1.1 The following items are not subject to retainage:

(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

«N/A»

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

No reduction of retainage below five percent (5%).

« »

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

(Insert any other conditions for release of retainage upon Substantial Completion.)

«Deleted in its entirety»

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201-2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201-2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

« »

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

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« » % « »

All payments shall be governed by the Local Government Prompt Payment Act as set forth in Sections 218.70 through 218.79, Florida Statutes, as amended.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

« Architect's actions, subject to recommendation to Owner, and Owner approval prior to action. »

« »

« »

« »

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

☐ Arbitration pursuant to Section 15.4 of AIA Document A201–2017

☒ Litigation in a court of competent jurisdiction. If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims shall be resolved by litigation, and shall have its venue located exclusively in the Circuit Court of Volusia County, Florida, and the Parties hereby expressly consent and submit themselves to the personal jurisdiction and venue of the Court.

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☐ Other (Specify)

« »

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017, as modified by Owner.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

« »

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017, as modified by Owner.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:

(Name, address, email address, and other information)

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« Susan Lovallo, Parks and Recreation Director »
« 1000 City Center Circle »
« Port orange, Florida 32129 »
« (386) 506-5852 »
« slovallo@port-orange.org »
« »

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

« »
« »
« »
« »
« »
« »

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

« »

§ 8.7 Other provisions:

§ 8.7.1 PUBLIC RECORD COMPLIANCE Contractor shall comply with public records laws as set forth in Section 119, Florida Statutes, and shall specifically: (a) keep and maintain public records that ordinarily and necessarily would be required by the City in order to perform the service; (b) provide the public with access to public records on the same terms and conditions that the City would provide the records at a cost that does not exceed the cost provided in Section 119, Florida Statutes, or as otherwise provided by law; (c) ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law; and (d) meet all requirements for retaining public records and transfer to the City, at no cost, all public records in possession of the Contractor upon termination of the Contract and destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. All records stored electronically must be provided to the City in a format that is compatible with the information technology systems of the City.

§ 8.7.2 RECORDS

The design, permits and all other records prepared by the Contractor, assembled for the City, subcontracted for the City, and any other records related to the scope of work in the possession of the Contractor shall be retained by the Contractor for the requisite time set forth in Florida Administration Code Rule 1 b-24

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<http://dos.myflorida.com/library-archives/records-management/>. Contractor may dispose of the records in accordance with Florida law, upon receipt of a signed written release signed by the City Attorney. Contractor agrees to indemnify the City for failure to comply with the requirements of this paragraph including costs of litigation and legal fees incurred through all appeals. City reserves the right to select and approve the defense attorney.

Field Code Changed

§ 8.7.3 FORCE MAJEURE

Neither party shall be liable for any delay in performance or failure to perform any obligation hereunder if, and to the extent that, such failure or delay is caused by an event of Force Majeure. Force Majeure shall mean any act, event or condition that is beyond the party's reasonable control, that materially and adversely affects the party's ability to perform its obligations hereunder, and that is not the result of the party's willful neglect, error, omission or failure to exercise reasonable due diligence.

§ 8.7.4 CONTRACT CONSTRUCTION

This Contract may be executed in one or more counterparts, each of which shall be deemed an original but all of which together constitute one and the same instrument. The delivery by facsimile or e-mail of an executed copy of this Contract shall be deemed valid as if an original signature was delivered. No contract shall be formed between the Contractor and the City until both Parties have signed this Contract.

§ 8.7.5 FINANCIAL DISCLOSURES

During the term of this Contract, Contractor covenants and agrees that it will keep adequate books and records of accounts in accordance with Generally Accepted Accounting Principals (GAAP). Contractor further covenants and agrees that in the event the Contractor becomes insolvent and/or fails to pay its current obligations when they become due, Contractor shall so advise Owner of such situation and, upon request from the Owner, Contractor shall provide to Owner financial statements of Contractor, including current income and expense statements of Contractor, consolidated balance sheets signed by a financial officer of Contractor, and audited reports provided by Contractor to Contractor's Surety, audited financial statements certified by a Certified Public Accountant concerning the financial affairs of the Contractor and all affiliates of Contractor, and such other financial information requested by Owner. All such financial information shall comply with GAAP.

In the event that Contractor becomes insolvent and/or fails to pay its obligations when they become due, Contractor hereby authorized its sureties, lenders, financial institutions and other third parties to release Owner financial information requested by Owner, including, but not limited to, the financial information described in the preceding paragraph.

§ 8.7.6 WAIVER OF JURY TRIAL

All parties hereby waive any and all right to any trial by jury in any action or proceeding arising directly or indirectly hereunder.

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ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor, [as modified by Owner with attached Exhibits "A" through "F."](#)
- .2 AIA Document A101™-2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™-2017, General Conditions of the Contract for Construction
- .4 [AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:](#)

(Insert the date of the E203-2013 incorporated into this Agreement.)

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«ITB 21-13 Bid Set Drawings and Specifications»

- .5 [Drawings](#)[Specifications](#)

Number	Title	Date

- .6 [Specifications](#)[Addenda, if any:](#)

Section	Number	Title	Date	Pages

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User Notes: (1114262113)

8

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.7 Addenda, if any Other Exhibits:

Number	Date	Pages
--------	------	-------

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9. (Check all boxes that apply and include appropriate information identifying the exhibit where required.)

☐ AIA Document E204™-2017, Sustainable Projects Exhibit, dated as indicated below: (Insert the date of the E204-2017 incorporated into this Agreement.)

☐

☐ The Sustainability Plan:

Title	Date	Pages
-------	------	-------

☐ Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
----------	-------	------	-------

.8 Other Exhibits documents, if any, listed below:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

☐ AIA Document E204™-2017, Sustainable Projects Exhibit, dated as indicated below: (Insert the date of the E204-2017 incorporated into this Agreement.)

☐

☐ The Sustainability Plan:

Title	Date	Pages
-------	------	-------

☐ Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
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.9 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

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« »

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

«Donald O. Burnette, Mayor»«»

(Printed name and title)

CONTRACTOR (Signature)

« »« »

(Printed name and title)

10

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End of Solicitation Documents

CITY OF PORT ORANGE, FLORIDA

INVITATION TO BID

"Attachment A" BID SET – Drawings

RENOVATION AND EXPANSION OF THE REC

Drawings can be found on the City of Port Orange website. See link for attachment of documents:

<https://www.port-orange.org/bids.aspx>

"Attachment A" ITB 21-13 Bid Set - Drawings for RENOVATION AND EXPANSION OF THE REC



ITB #21-13

Prepared by: Michael Hall, Purchasing Agent

Release Date: March 12, 2021

Bid Due Date & Time: April 19, 2021 @ 2:30 PM

City of Port Orange, Florida
1000 City Center Circle
Port Orange, FL 32129
(386) 506-5740
purchdiv@port-orange.org
www.port-orange.org

*BUILDING PLANS FOR:
CITY OF PORT ORANGE - THE REC
CITY CENTER CIRCLE, PORT ORANGE, FL*

PARTITION & SYMBOL LEGEND

VICINITY PLAN
NOT TO SCALE

DRAWING SCHEDULE	
DWG	SHEET NAME
MEP DRAWINGS	
M01	MECHANICAL - GENERAL INFORMATION
M02	MECHANICAL - SCHEDULES
M10	MECHANICAL - PARTIAL FIRST FLOOR PLAN
M11	MECHANICAL - PARTIAL FIRST FLOOR PLAN
M12	MECHANICAL - PARTIAL SECOND FLOOR PLAN
M13	MECHANICAL - PARTIAL SECOND FLOOR PLAN
M14	MECHANICAL - ROOF PLAN
M5.1	MECHANICAL - DETAILS
M5.2	MECHANICAL - DETAILS
M5.3	MECHANICAL - DETAILS
P01	PLUMBING - GENERAL INFORMATION
P02	PLUMBING - SCHEDULES
P10	PLUMBING - PARTIAL FIRST FLOOR SANITARY PLAN
P11	PLUMBING - PARTIAL FIRST FLOOR SANITARY PLAN
P12	PLUMBING - PARTIAL SECOND FLOOR SANITARY PLAN
P13	PLUMBING - PARTIAL SECOND FLOOR SANITARY PLAN
P14	PLUMBING - ROOF PLAN
P20	PLUMBING - PARTIAL FIRST FLOOR DOMESTIC WATER PLAN
P21	PLUMBING - PARTIAL FIRST FLOOR DOMESTIC WATER PLAN
P22	PLUMBING - PARTIAL SECOND FLOOR DOMESTIC WATER PLAN
P23	PLUMBING - PARTIAL SECOND FLOOR DOMESTIC WATER PLAN
P5.1	PLUMBING - DETAILS
P6.1	PLUMBING - SANITARY RISER DIAGRAMS
P6.2	PLUMBING - RAIN WATER RISE DIAGRAMS
P7.1	PLUMBING - DOMESTIC WATER RISER DIAGRAMS
E01	ELECTRICAL LEGENDS AND NOTES
E510	ELECTRICAL - SITE PLAN - DEMOLITION
E511	ELECTRICAL - SITE PLAN - NEW WORK
E10	ELECTRICAL - FIRST FLOOR DEMO PLAN
E11	ELECTRICAL - SECOND FLOOR DEMO PLAN
E10	ELECTRICAL - FIRST FLOOR - LIGHTING PLAN
E11	ELECTRICAL - FIRST FLOOR - LIGHTING PLAN
E12	ELECTRICAL - SECOND FLOOR - LIGHTING PLAN
E13	ELECTRICAL - SECOND FLOOR - LIGHTING PLAN
E20	ELECTRICAL - FIRST FLOOR - POWER PLAN
E21	ELECTRICAL - FIRST FLOOR - POWER PLAN
E22	ELECTRICAL - SECOND FLOOR - POWER PLAN
E23	ELECTRICAL - SECOND FLOOR - POWER PLAN
E30	ELECTRICAL - FIRST FLOOR - SYSTEMS & FIRE ALARM PLAN
E31	ELECTRICAL - FIRST FLOOR - SYSTEMS & FIRE ALARM PLAN
E32	ELECTRICAL - SECOND FLOOR - SYSTEMS & FIRE ALARM PLAN
E33	ELECTRICAL - SECOND FLOOR - SYSTEMS & FIRE ALARM PLAN
E40	ELECTRICAL - LIGHTING PROTECTION SYSTEM PLAN
E50	ELECTRICAL - DETAILS AND DIAGRAMS
E5.1	ELECTRICAL - TYPICAL LIGHTING PROTECTION DETAILS
E6.0	ELECTRICAL - SINGLE LINE DIAGRAMS
E6.1	ELECTRICAL - LIGHTING CONTROL DIAGRAMS
E70	ELECTRICAL - ELECTRICAL SCHEDULES
E71	ELECTRICAL - PANEL SCHEDULES
E72	ELECTRICAL - PANEL SCHEDULES
FIRE PROTECTION DRAWINGS	
FP01	FIRE PROTECTION - GENERAL INFORMATION
FP10	FIRE PROTECTION - FIRST FLOOR PLAN
FP20	FIRE PROTECTION - SECOND FLOOR PLAN

1. THESE DRAWINGS AND THE PROJECT MANUAL ARE COMPLEMENTARY, AND ANY REQUIREMENT OF ONE SHALL BE A REQUIREMENT OF THE OTHER. IT IS THE CONTRACTORS RESPONSIBILITY TO EXAMINE THE DRAWINGS AND SPECIFICATIONS AND TO COMPARE THE REQUIREMENTS OF EACH DIVISION (i.e. CIVIL, ARCHITECTURAL, STRUCTURAL, ELECTRICAL, ETC.) AND ENSURE THAT EACH TRADE OR SUBCONTRACTOR IS MAKING THE ALLOWANCES NECESSARY TO PROVIDE THE OWNER A COMPLETE FACILITY, OPERATIONAL IN ALL RESPECTS, UNLESS OTHERWISE SPECIFICALLY NOTED IN THE DRAWINGS OR PROJECT MANUAL. IT IS ALSO THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE ARCHITECT/ENGINEER OF ANY DEFICIENCIES OR DISCREPANCIES AMONG THE DIVISIONS OF THE DRAWINGS AND SPECIFICATIONS PRIOR TO THE BID DATE. NEITHER THE OWNER NOR ARCHITECT/ENGINEER WILL BE RESPONSIBLE FOR ANY DEFICIENCIES OR DISCREPANCIES RAISED AFTER THE BID OPENING. ACCORDINGLY, IN LIGHT OF THESE OBLIGATIONS, THE ARCHITECT/ENGINEER IS OBLIGATED TO INTERPRET THE DRAWINGS AND SPECIFICATIONS IN A MANNER THAT WILL PROVIDE THE OWNER WITH A COMPLETE, FUNCTIONING FACILITY FOR THE BID PRICE.
2. ALL IMPROVEMENTS SHALL BE IN ACCORDANCE WITH FLORIDA STATUTES CHAPTER 553 WITH RESPECT TO HANDICAPPED ACCESSIBILITY DESIGN AND CONSTRUCTION STANDARDS.
3. ALL NEW DOORS INSTALLED IN THE MEANS OF EGRESS INCLUDING EXIT ACCESS DOORS FROM ALL WALK-IN ROOMS AND AREAS SHALL BE 36" WIDE THEREBY PROVIDING A MINIMUM 32" CLEAR OPENING.
4. DOOR HARDWARE FURNISHED FOR NEW DOORS OR RELOCATED DOORS INSTALLED IN THE MEANS OF EGRESS, INCLUDING EXIT ACCESS DOORS, WILL BE OPERABLE FROM THE INSIDE WITHOUT SPECIAL KEY EFFORT OF KNOWLEDGE. THE HARDWARE SHALL BE LEVER HANDLE OR EQUAL/PANIC HARDWARE IN ASSEMBLY OCCUPANCY) PER FLORIDA STATUTE 553. DOORS SHALL RELEASE WHEN NO MORE THAN 15 LB. IS APPLIED TO THE RELEASING APPROVED, DOOR CLOSER PER NFPA 5-12.1 (C).
5. CHANGES IN ELEVATIONS OF 1/4" TO 1/2" SHALL BE BEVELED AT A SLOPE OF 1:2 OR LESS, CHANGES IN ELEVATION OF 1/2" TO 30" SHALL BE RAMPED WITH REQUIRED PLATFORMS AND RAILINGS PER THE 2011 EDITION OF THE FLORIDA BUILDING CODE.
6. ANY AND ALL DEVIATIONS FROM SPECIFIED PRODUCTS MUST BE APPROVED BY THE ARCHITECT.
7. PAINT ALL NEW SURFACES AS SCHEDULED AND AS REQUIRED TO ASSURE A UNIFORM APPEARANCE.
8. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO CONTROL DUST AND MUD ASSOCIATED WITH THE WORK OF THIS PROJECT. EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND METHOD USED SHALL MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS, PER FDOT SPECIFICATIONS, SECTION 104.
9. ALL PROPOSED CONSTRUCTION SHALL BE PURSUANT TO INFORMATION SHOWN ON THESE PLANS AND LOCAL CODES. ALL NECESSARY LICENSES AND PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AT HIS EXPENSE UNLESS PREVIOUSLY OBTAINED BY THE OWNER.
10. THE EXISTENCE AND LOCATION OF HIDDEN UTILITIES ARE NOT GUARANTEED AND SHALL BE INVESTIGATED AND VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING WORK. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGES TO, AND FOR PROPER MAINTENANCE PROTECTION OF, EXISTING UTILITIES AND STRUCTURES DURING THE CONSTRUCTION PROCESS. THE CONTRACTOR SHALL BE LIABLE FOR ANY COSTS ASSOCIATED WITH THE RELOCATION OF TELEPHONE OR GAS LINES BY THE UTILITY COMPANIES.
11. THE CONTRACTOR SHALL PROVIDE SAFE, SUFFICIENT, AND PROPER FACILITIES AT ALL TIMES FOR THE INSPECTION OF THE WORK BY THE OWNER, ENGINEER, AND ALL APPROPRIATE GOVERNMENTAL AND REGULATORY AGENCIES.
12. PARTITION WALLS SHALL BE CONSTRUCTED OF MATERIALS AS ALLOWED BY MINIMUM TYPE IIB CONSTRUCTION TYPE PER CHAPTER 7 OF THE 2011 EDITION OF THE FLORIDA BUILDING CODE.
13. INTERIOR FINISH CLASSIFICATION SHALL BE CLASS 'A' FLAME SPREAD 0-25 SMOKE DEVELOPED 0-450 AT EXIT ACCESS AND CLASS 'B' FLAME SPREAD 26-75, SMOKE DEVELOPED 0-450 AT OTHER AREAS AS PER CHAPTER 8 OF THE 2011 EDITION OF THE FLORIDA BUILDING CODE FOR TYPE IIB CONSTRUCTION TYPE.
14. NEW TABLES, WORK SURFACES, COUNTER HEIGHTS, UNDER SURFACE CLEARANCE AND OVER COUNTER REACH SHALL COMPLY WITH THE 2011 EDITION OF THE FLORIDA BUILDING CODE. ACCESSIBILITY THESE WORK SURFACES SHALL PROVIDE A MINIMUM UNDER SURFACE HEIGHT OF 28"-34" FOR EACH POSSIBLE WHEELCHAIR LOCATION AND WITH 48" CLEARANCE AROUND THE COUNTER FOR MANEUVERING CLEARANCE.

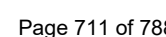
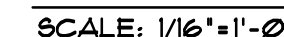
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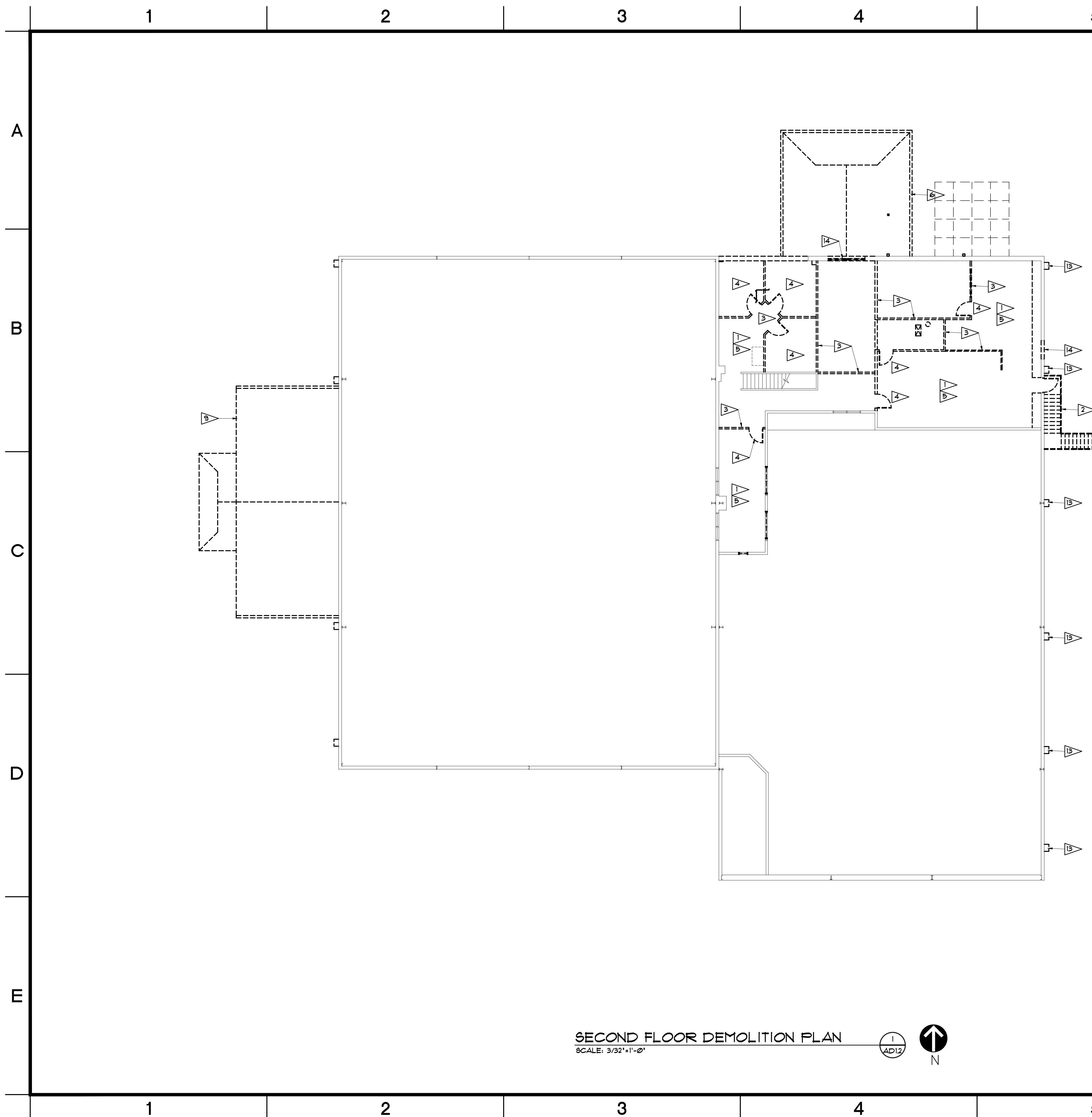


SYMBOL	DESCRIPTION	REMARKS
	1 HOUR FIRE RATING	
	2 HOUR FIRE RATING	
	FIRE DOOR / RATING (HOURS)	
	LIFE SAFETY SYMBOLS	
	FIRE EXTINGUISHER	
	EGRESS CAPACITY FACTOR	
	A) DOOR SIZE OR STAIR WIDTH (INCHES) B) EGRESS CAPACITY FACTOR (INCHES) C) MAX ALLOWABLE LOAD D) ACTUAL OCCUPANT LOAD	
	OCCUPANT LOAD	
	A) OCCUPANCY PER TABLE 1004.12 B) ACTUAL FLOOR AREA C) OCCUPANT LOAD FACTOR PER TABLE 1004.12 D) ACTUAL LOAD	
	TRAVEL DISTANCE	
	DISTANCE FROM MOST REMOTE POINT IN OCCUPANT AREA	
	DIRECTION OF TRAVEL / PATH OF TRAVEL	
	START / FINISH OF TRAVEL DISTANCE	
	EMERGENCY EXIT LIGHTS	

OCCUPANTS MEN WOMEN	WATER CLOSETS		LAVATORIES		DRINKING FOUNTAINS	SERVICE SINKS
	MALE	FEMALE	MALE	FEMALE		
	1/150	1/75	1/200	1/200		
REQUIRED	1	2	1	1	1	1
PROVIDED (NEW)	5 WC / 2 UR	6	7	7	2	1
EXISTING	1 WC / 1 UR	2	2	2	0	0

PROJECT • 02354.20	DATE: 6.3.2018
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DEMOLITION GENERAL NOTES

1. DEMOLITION SHALL BE COMPLETED ONLY TO EXTENT NECESSARY TO PERFORM NEW WORK. ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETELY. PATCH HOLES & SURFACES REMAINING SHALL BE SMOOTH, CLEAN, AND READY TO ACCEPT NEW WORK, TYPICALLY.
2. OWNER WILL REMOVE MOVABLE APPLIANCES (COMPUTERS), FURNITURE AND EQUIPMENT, FURNISHINGS AND ARTWORK PRIOR TO START OF DEMOLITION. TYPICAL IN ALL ROOMS SHOWN.
3. SEE ELECTRICAL PLANS FOR SCOPE OF WORK.
4. CAP AND REPAIR ANY DAMAGE TO IRRIGATION SYSTEM DURING CONSTRUCTION.

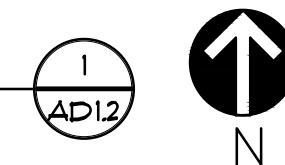
PARTITION AND SYMBOL LEGEND

-
- EXISTING PARTITION TO REMAIN
- EXISTING PARTITION OR ELEMENT TO BE REMOVED
- NEW WALL OR PARTITION
- DOOR AND FRAME TO BE REMOVED.
- EXISTING DOOR AND FRAME TO REMAIN.
- NEW DOOR, FRAME & HARDWARE
- EXISTING SLAB ON GRADE TO BE REMOVED.

DEMOLITION FLAG NOTES:

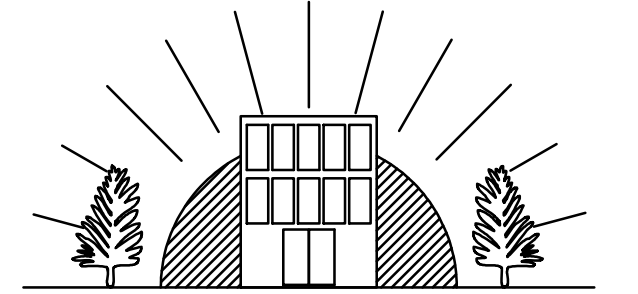
- 1 REMOVE ALL FLOOR FINISHES (CARPET, HARD TILE OR VINYL TILE) AND BASE. PREPARE ALL FLOOR FOR NEW FINISHES. TYPICAL IN ALL AREAS AFFECTED.
- 2 REMOVE EXISTING STAIRS AS SHOWN.
- 3 REMOVE EXISTING WALLS AND ASSOCIATED APPURTENANCES TO EXTENT SHOWN AND AS NECESSARY TO PERFORM NEW WORK.
- 4 REMOVE EXISTING DOOR, FRAME AND HARDWARE IN ITS ENTIRETY.
- 5 REMOVE EXISTING ACOUSTICAL PANELS & SUSPENSION SYSTEM TO THE EXTENT INDICATED.
- 6 REMOVE EXISTING PORTE COCHERE, INCLUDING SLAB ON GRADE, FOUNDATIONS, COLUMNS, BEAMS & ROOF.
- 7 DEMOLISH EXISTING TOILET PARTITIONS / BRACING.
- 8 REMOVE EXISTING FENCE ENCLOSURE AND RELOCATE MECHANICAL EQUIPMENT, PER MECH. DWS.
- 9 REMOVE EXISTING PORTICO AND STORAGE ADDITION, INCLUDING SLAB ON GRADE & FOUNDATION.
- 10 REMOVE CATCH BASIN AND STORM PIPE PER CIVIL DRAWINGS.
- 11 REMOVE EXISTING IRRIGATION PIPING AND VALVES.
- 12 REMOVE EXISTING PLUMBING FIXTURES. PREPARE CONNECTIONS FOR NEW WATER CLOSETS, LAVATORIES AND URINALS. SEE PLUMBING DRAWINGS.
- 13 DEMOLISH EXISTING DOWNSPOUT ENCLOSURES. REPAIR DAMAGED SUB-STRATE AND PREPARE FOR NEW FINISH.
- 14 REMOVE EXISTING WINDOW AS SHOWN. PATCH OPENING PER REVISED PLAN.
- 15 REMOVE EXISTING SANITARY PIPING. SEE CIVIL DRAWINGS.
- 16 REMOVE AND RELOCATE BRONZE DEDICATION PLAQUE. PER OWNER'S DIRECTIVE.
- 17 EXISTING PDC TO BE RELOCATED.
- 18 RELOCATE FLOOR DRAIN TO ROOM 108A & RECONNECT AS SHOWN ON PLUMBING DRAWINGS.
- 19 RELOCATE DATA RACK TO ROOM 108A.
- 20 REMOVE EXISTING AHU/ACU - ALTERNATE "1".

SECOND FLOOR DEMOLITION PLAN



DESIGN, INC.

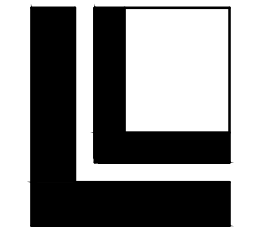
913 NORTH NOVA RD.
HOLLY HILL, FL 32117
AA 26000567
PHONE (386) 255-6987
FAX (386) 255-6989

ARCHITECT.

DELOSE O'NEAL ENGINEERING

P.O. BOX 304 P (407) 766-2813
Goldenrod, FL 32733 C (321) 277-4128

CONSULTANTS:



LOWE STRUCTURES, INC.

11651 Central Parkway, Suite 106
Jacksonville, FL 32224
(904) 992-0377
FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

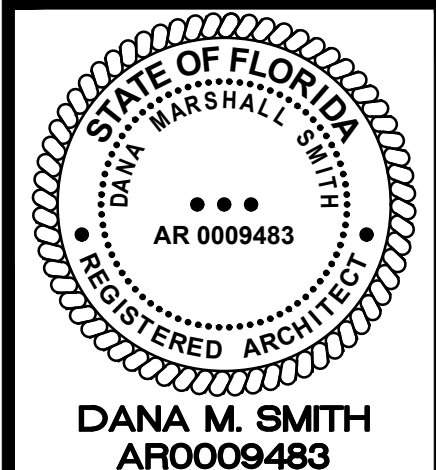
CONSULTANTS:

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DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
SECOND FLOOR
DEMOLITION PLAN



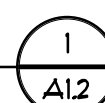
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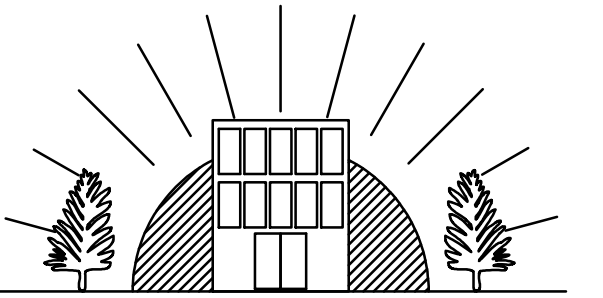


SCALE: 1/8"=1'-0"



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913 NORTH NOVA RD.
HOLLY HILL, FL 32117
AA 28000567
PHONE (386) 256-6887
FAX (386) 256-6889

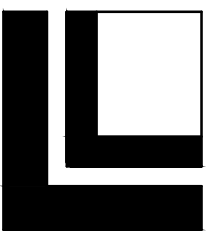
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CONSULTANTS:



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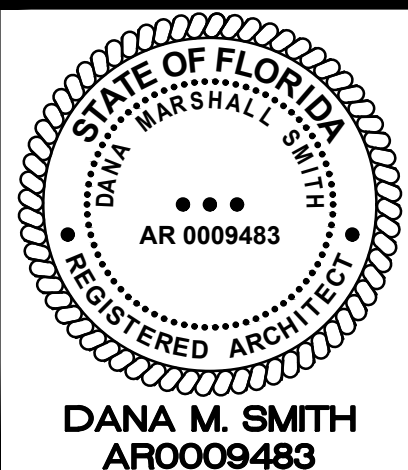
11651 Central Parkway, Suite 106
Jacksonville, FL 32224
(904) 992-0377
FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

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DESIGNED BY: DMS
REVIEWED BY: DMS

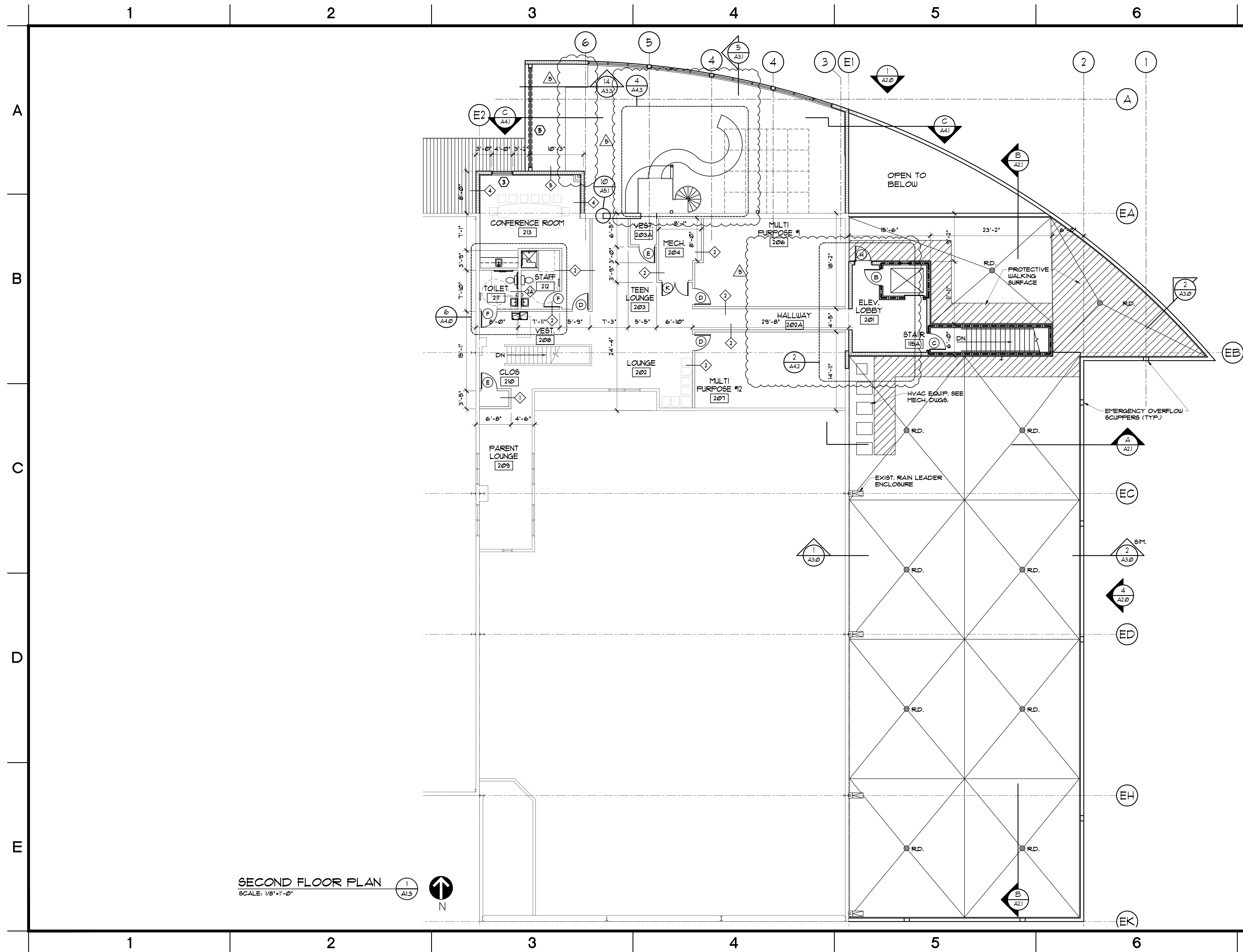
PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

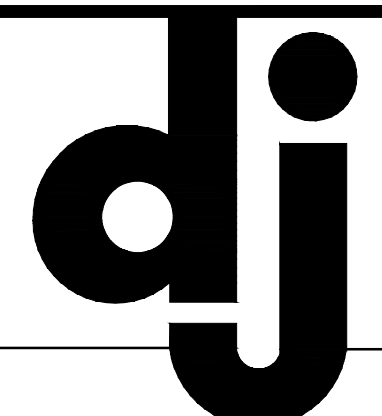
SHEET TITLE
PARTIAL SECOND
FLOOR PLAN



SHEET #
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PROJECT	02354.20	DATE:	6.3.2018
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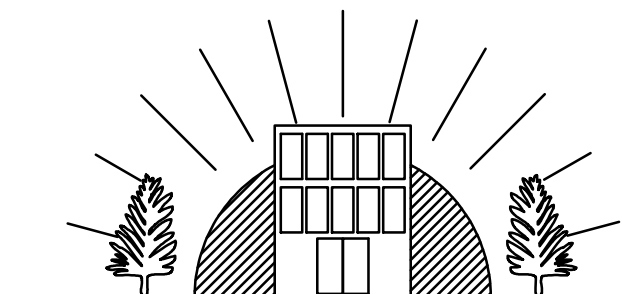




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PHONE (386) 256-6887
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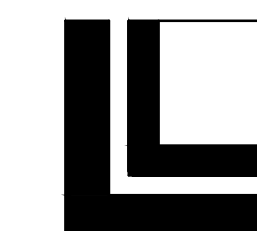
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CONSULTANTS:



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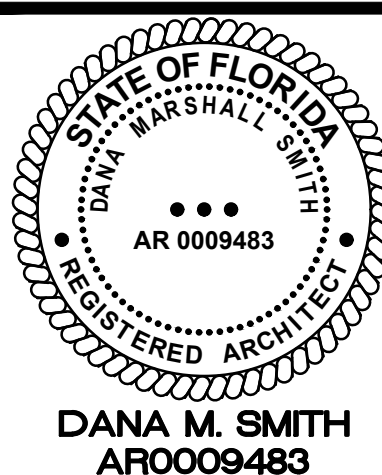
CONSULTANTS:

REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.6.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.8.2020
4	PERMIT SET	11.6.2020
5	REVISED PERMIT SET	2.22.2021

DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

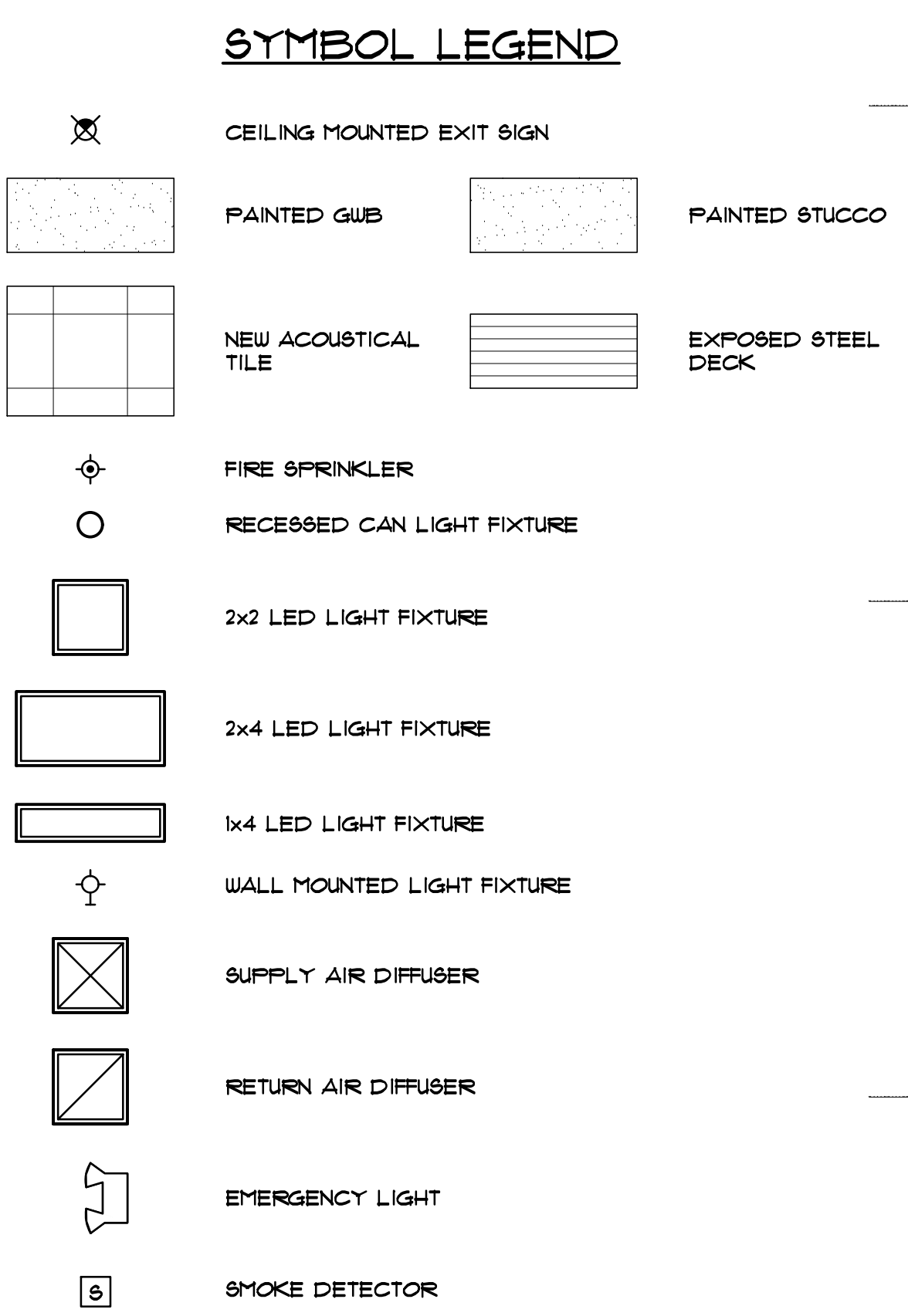
SHEET TITLE
**PARTIAL SECOND
FLOOR PLAN**



DANA M. SMITH
AR0009483

SHEET #
A1.3

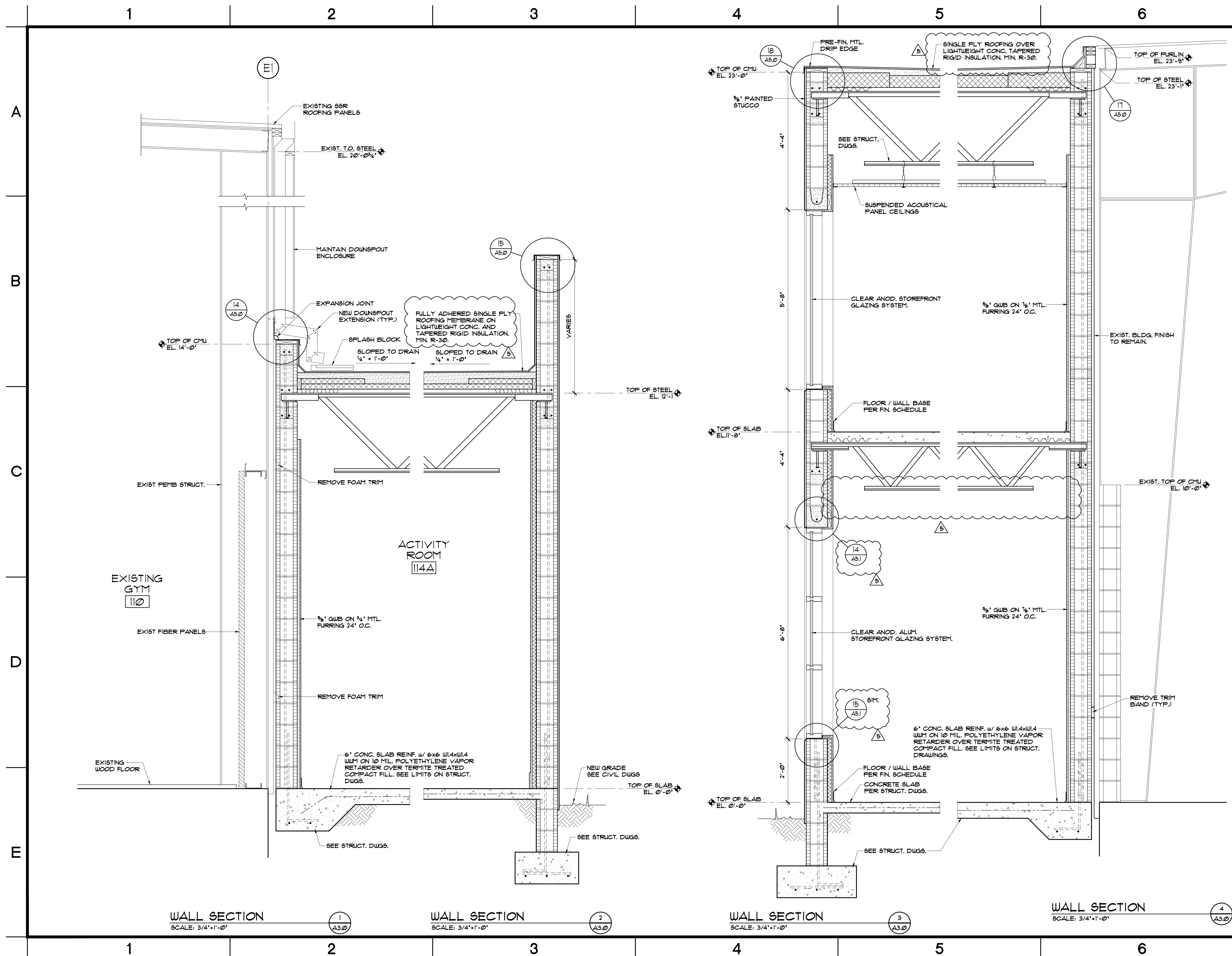
PROJECT # 02354.20 DATE: 6.3.2018

ITB 21-13 RENOVATION AND EXPANSION OF THE REC
Page 1869 of[illegible]



 DANA M. SMITH AR0009483	SHEET # A1.7
PROJECT • 02354.20	DATE: 6.3.2018

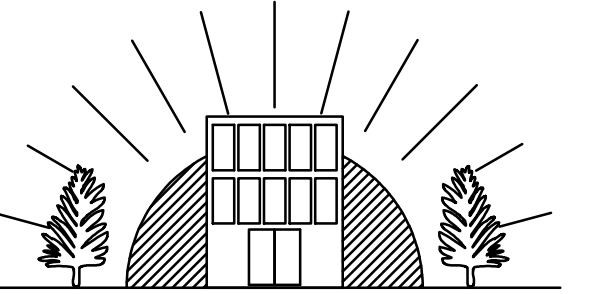
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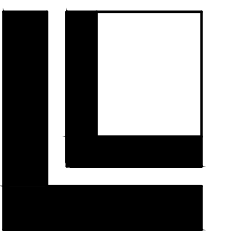
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**DELOSE O'NEAL ENGINEERING**

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FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

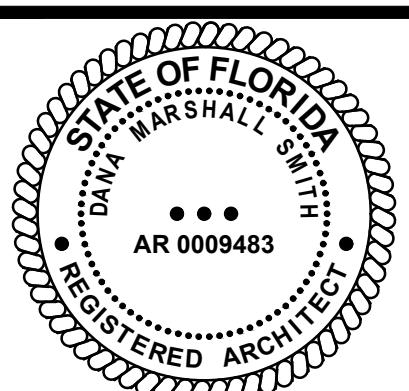
CONSULTANTS:

[illegible]

DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

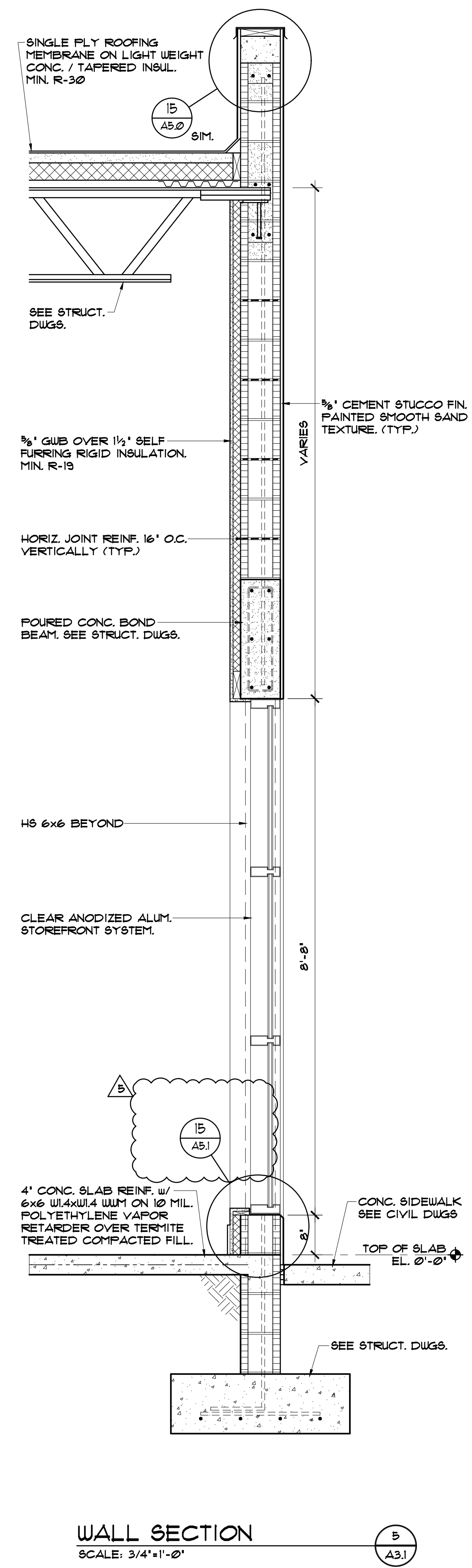
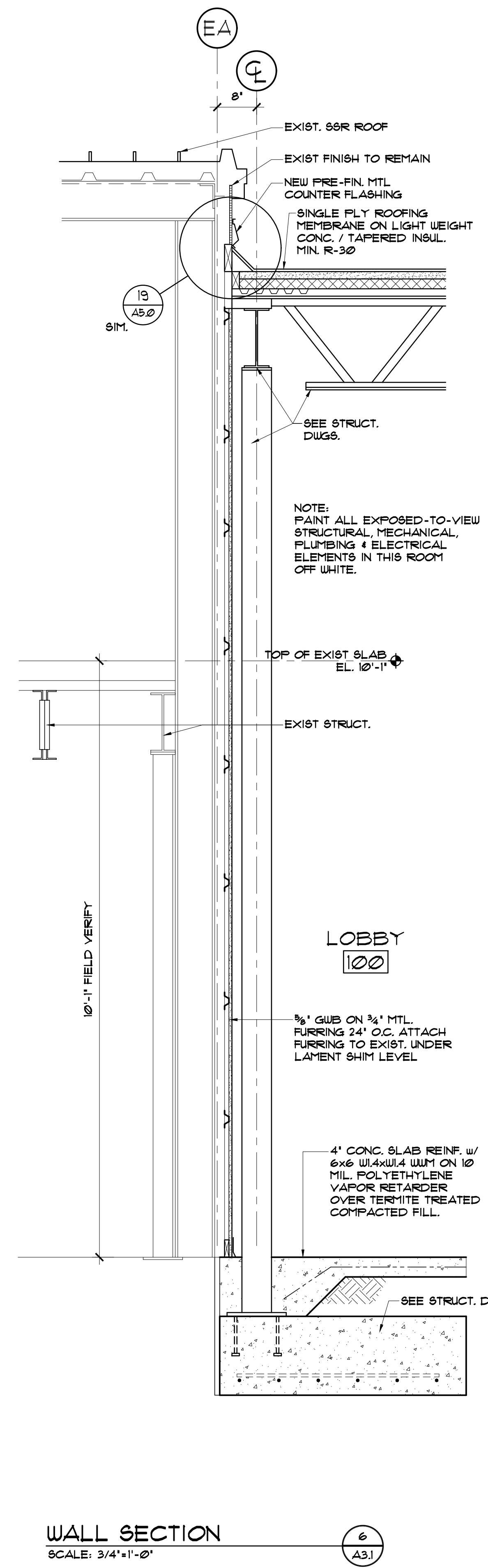
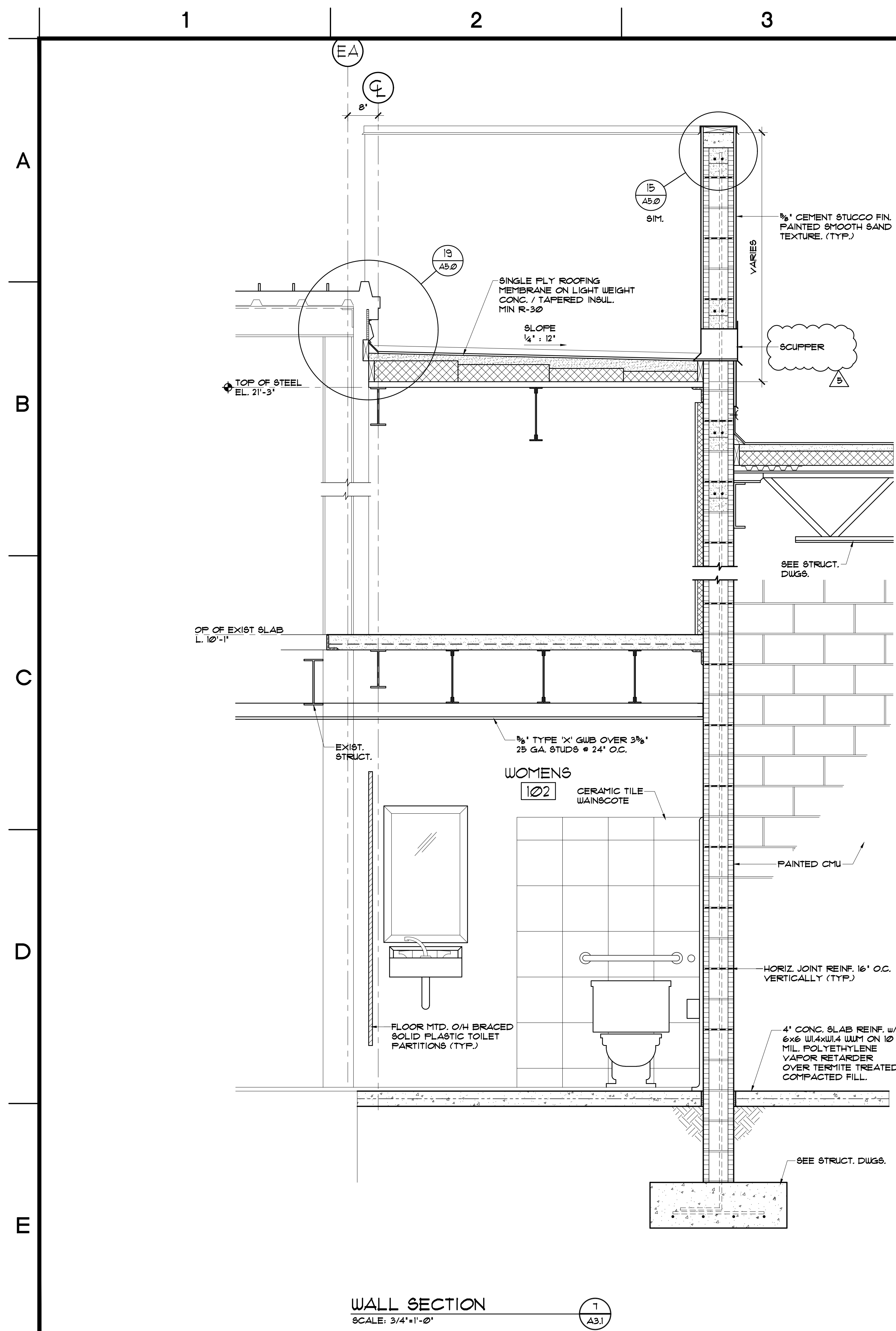
SHEET TITLE
WALL SECTIONS



DANA M. SMITH
AR0009483

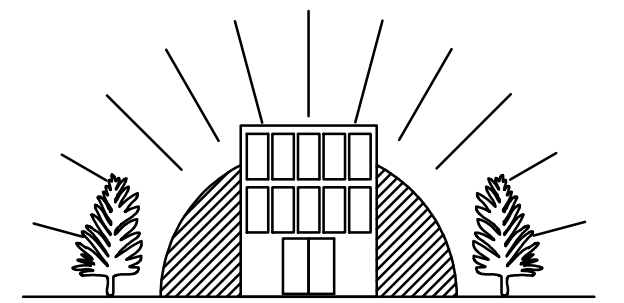
SHEET #
A3.0

PROJECT • 02354.20	DATE 6.3.2018
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DESIGN, INC.

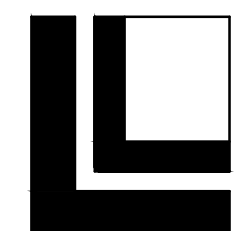
913 NORTH NOVA RD.
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C (321) 277-4128



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EOR: J. Matthew Lowe FL PE: 59027

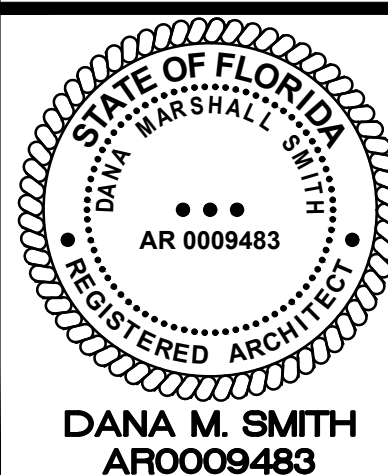
CONSULTANTS:

[illegible]

DRAWN BY:	DJS
DESIGNED BY:	DMS
REVIEWED BY:	DMS

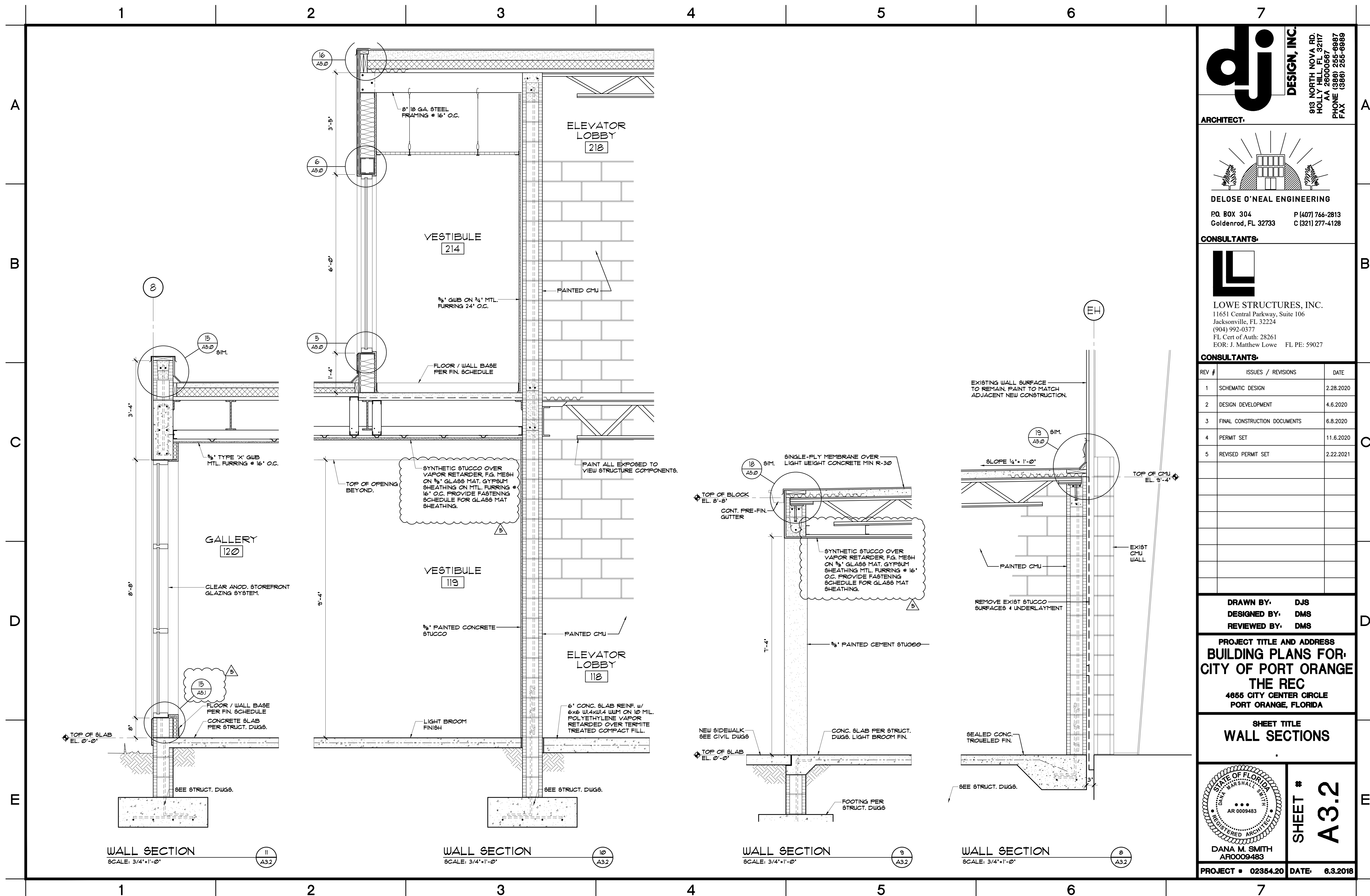
PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

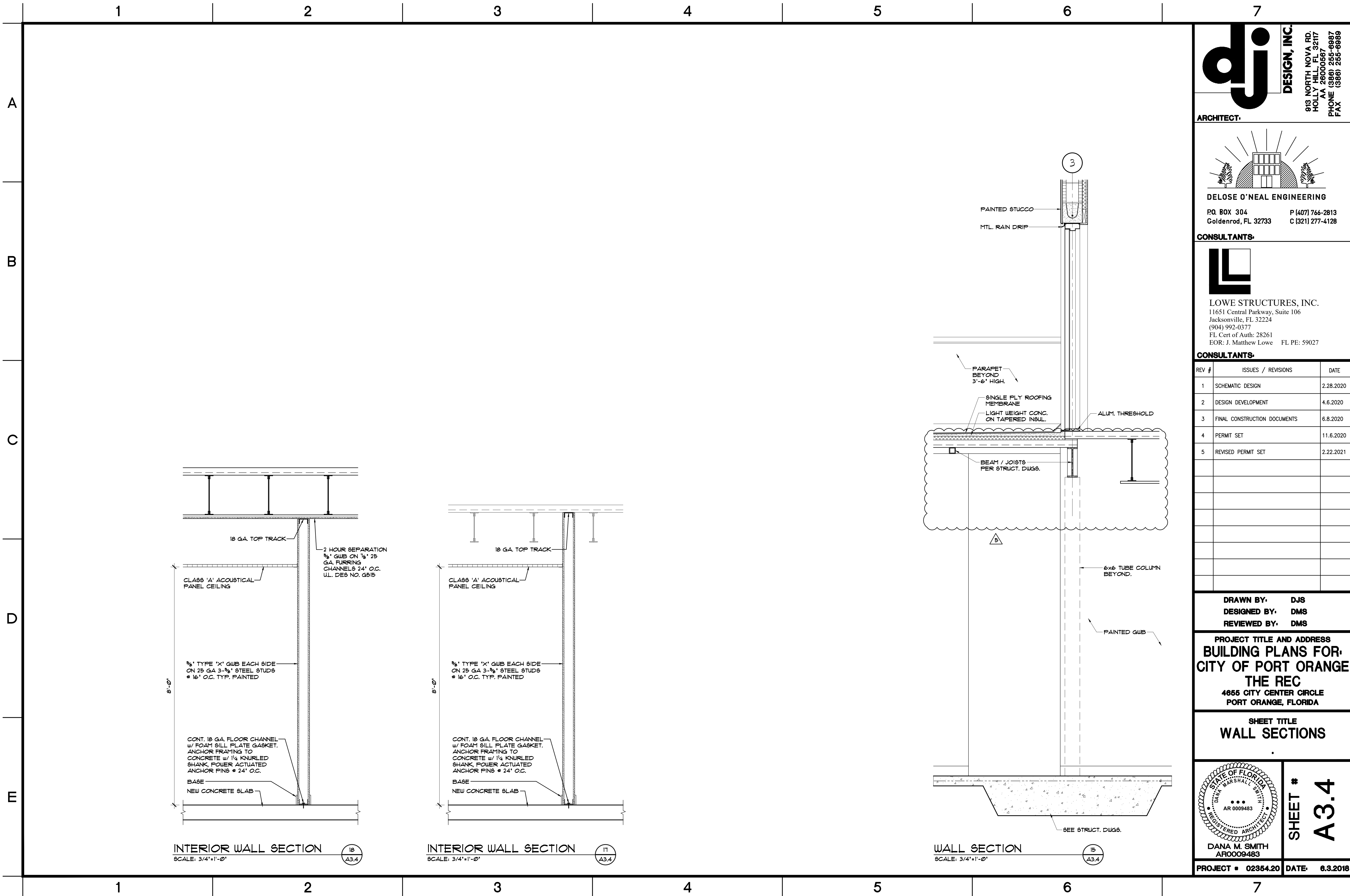
SHEET TITLE
WALL SECTIONS



PROJECT #	02354.20	DATE:	6.3.2018
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SHEET #
A3.1

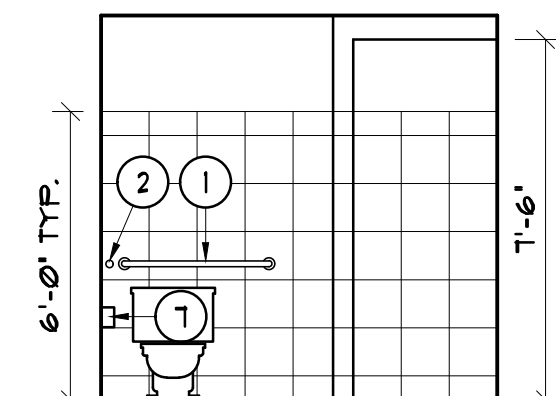


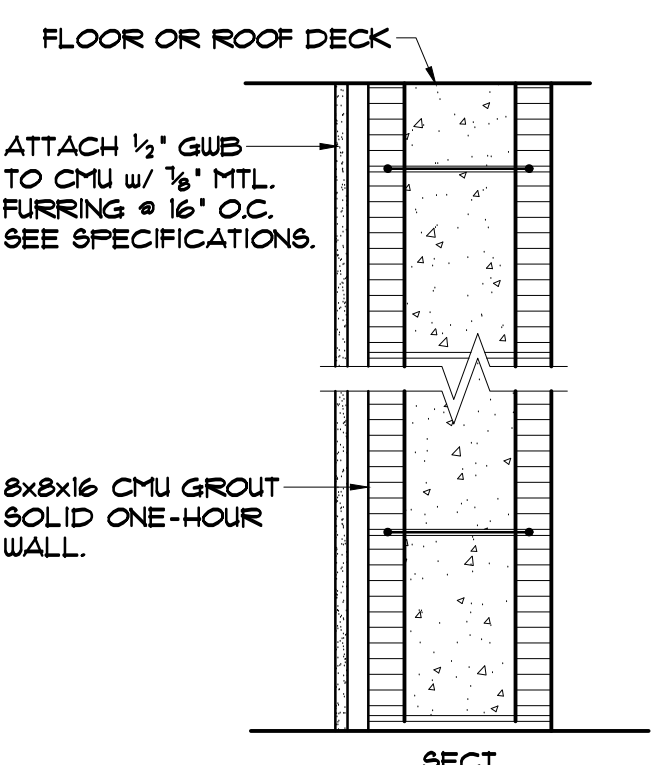


dj
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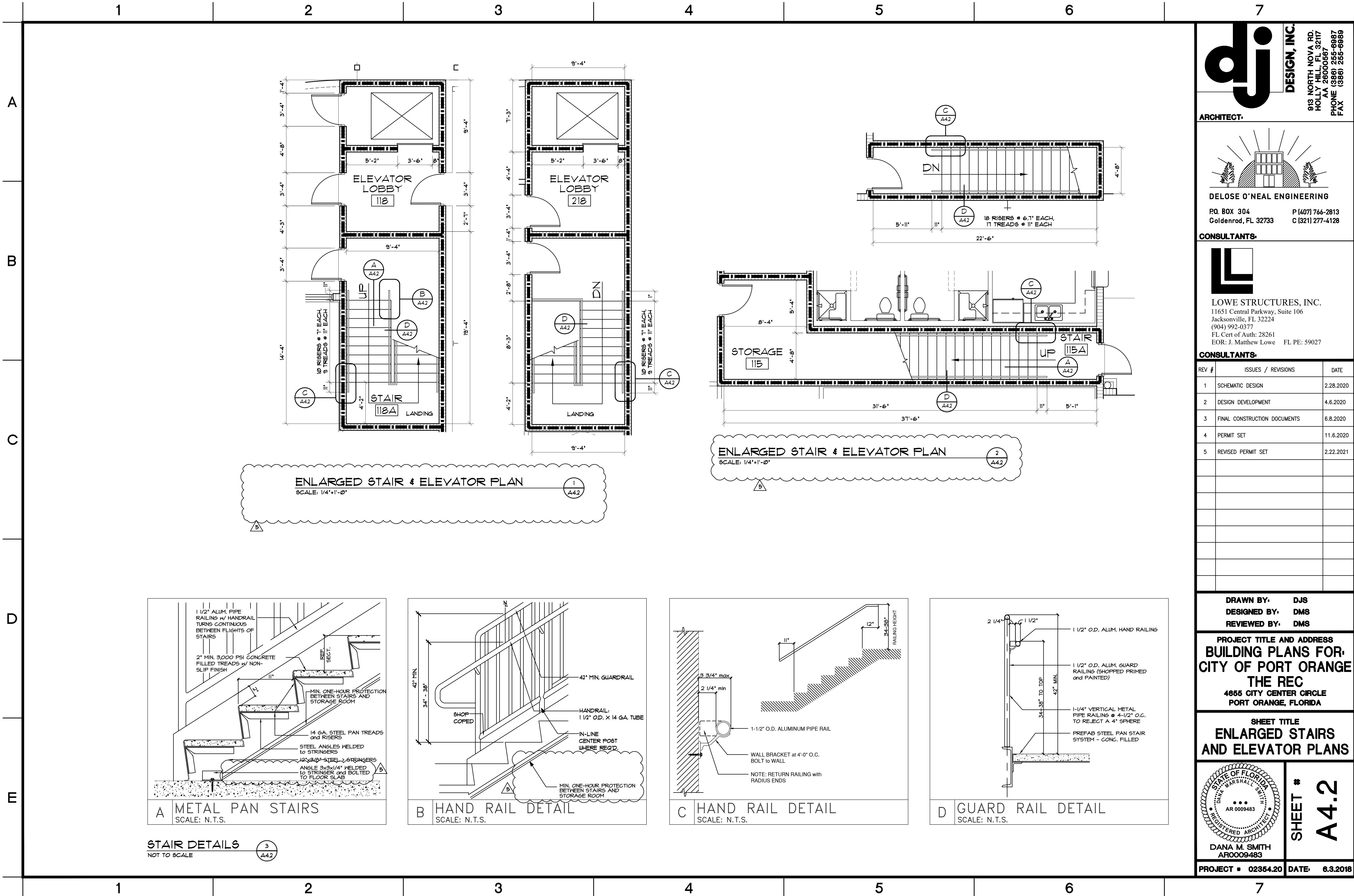
ARCHITECT.
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FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027





1
A4.1



A

B

C

D

E

CROSS SECTION

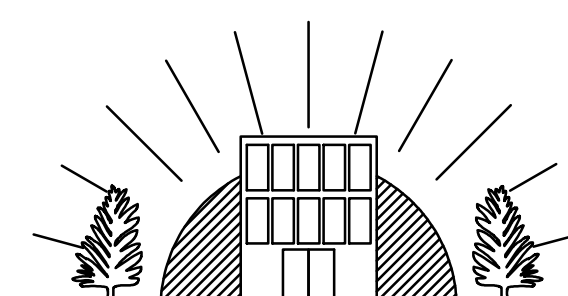
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A4.3



DESIGN, INC.

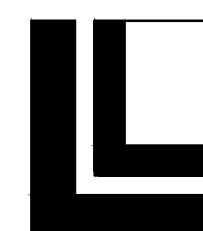
1913 NORTH NOVA RD.
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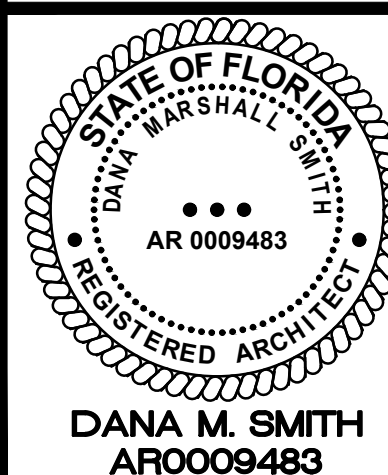
CONSULTANTS.

[illegible]

DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

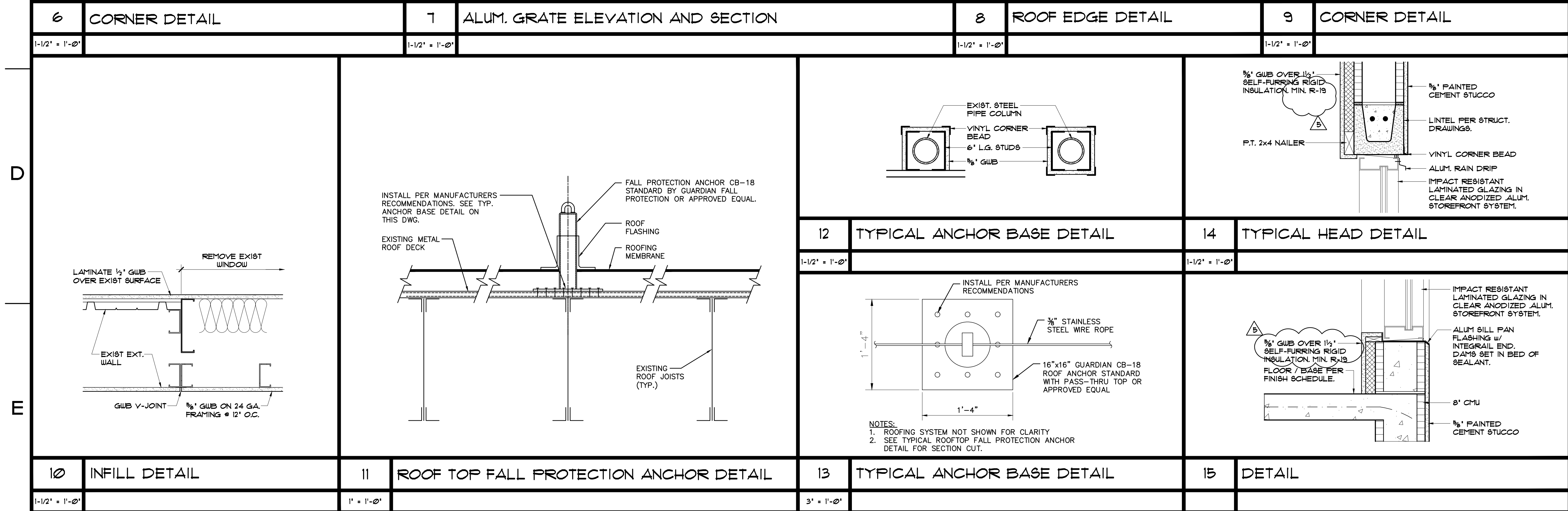
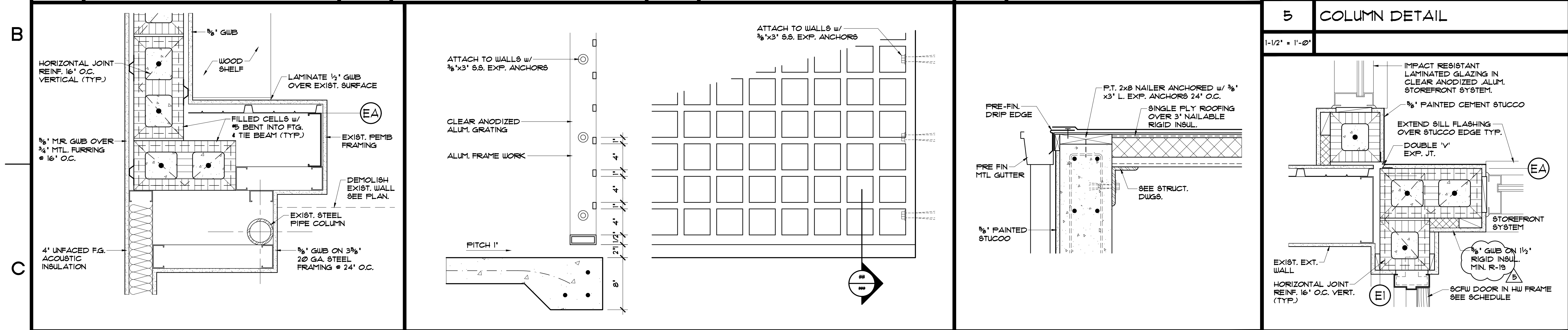
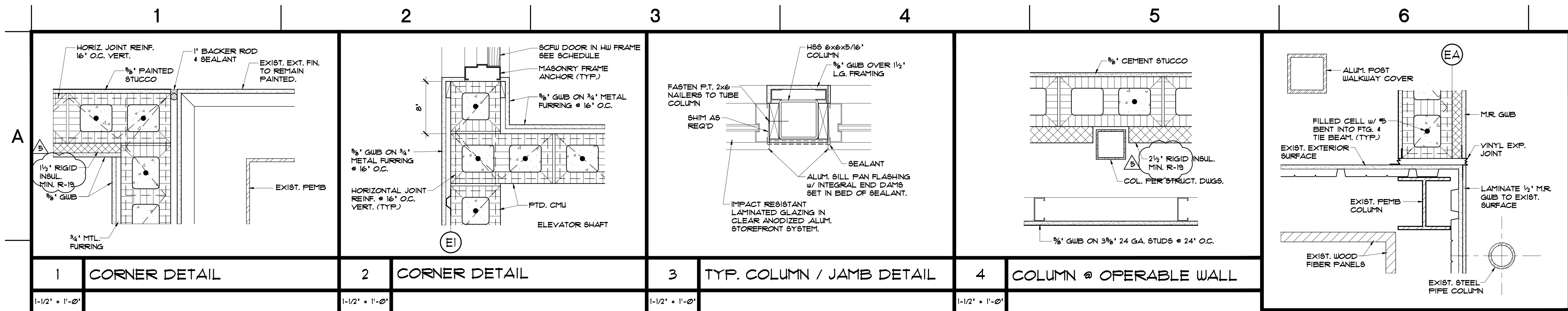
PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
ENLARGED RECEPTION
DESK DETAILS



SHEET #
A4.3

PROJECT • 02354.20	DATE 6.3.2018
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ARCHITECT.

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EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.6.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.8.2020
4	PERMIT SET	11.6.2020
5	REVISED PERMIT SET	2.22.2021

DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
DETAILS

STATE OF FLORIDA
DANA M. SMITH
REGISTERED ARCHITECT
AR 0009483

SHEET #
A5.1

PROJECT # 02354.20 **DATE** 6.3.2018

[illegible]

Figure 1 illustrates various fire door types and details. The diagrams are labeled as follows:

- F**: Solid fire door.
- L**: Fire door with a small rectangular glass insert at the bottom.
- TL**: Fire door with a rectangular glass insert near the top.
- LL**: Fire door with two rectangular glass inserts, one near the top and one near the bottom.
- V**: Fire door with a vision glass panel (EQ) and a handle (EQ).
- VL**: Fire door with a vision glass panel (EQ) and a handle (EQ).
- Z**: Fire door with a vision glass panel (EQ) and a handle (EQ).
- NL**: Fire door with a vision glass panel (EQ) and a handle (EQ).
- G**: Fire door with a glass insert (EQ) and a handle (EQ).
- GL**: Fire door with a glass insert (EQ) and a handle (EQ).
- FG**: Fire door with a glass insert (EQ) and a handle (EQ).
- FL**: Fire door with a glass insert (EQ) and a handle (EQ).
- BP**: Fire door with a glass insert (EQ) and a handle (EQ).
- BF**: Fire door with a glass insert (EQ) and a handle (EQ).
- OH**: Fire door with a glass insert (EQ) and a handle (EQ).

NOTE: MAX. AREA OF VISION GLASS FOR INTERIOR FIRE DOORS IN ONE-HOUR ENCLOSURES SHALL BE 100 SQ. IN.

[illegible]

NOTE:
ALL EXTERIOR WINDOWS SHALL BE IMPACT-RESISTANT LAMINATED
GLAZING IN CLEAR ANODIZED STOREFRONT FRAMING SYSTEM.

EXTERIOR DOORS

1-1-1	- 3 BUTT HINGES STOREROOM LOCKSET THRESHOLD WEATHERSTRIPPING DOOR STOP
1-1-2	- 3 BUTT HINGES PASSAGE LOCKSET - ALWAYS OPENABLE FROM INT. CLOSER PANIC HARDWARE THRESHOLD WEATHERSTRIPPING
1-2-1	- 6 FR BUTT HINGES STOREROOM LOCKSET-ALWAYS OPENABLE FROM INT. INACTIVE LEAF w/ HEAD / FLOOR PINS THRESHOLD WEATHERSTRIPPING
1-2-2	- PIVOT HINGES 1 LOCKSET - ALWAYS OPENABLE FROM INT. PANIC HARDWARE THRESHOLD WEATHERSTRIPPING
1-2-3	- PIVOT HINGES STOREROOM LOCKSET PANIC HARDWARE CLOSER w/ PANIC HARDWARE

2-1-1 - 3 BUTT HINGES
PRIVACY LOCKSET

2-1-2 - 3 BUTT HINGES 180° OPENING
STOREROOM LOCKSET

2-1-3 - 3 BUTT HINGES
PUSH / PULL
CLOSER
KICK PLATE BOTH FACES

2-1-4 - 3 BUTT HINGES
CLASSROOM LOCKSET

2-1-5 - 3 BUTT HINGES
ENTRANCE LOCKSET
ALWAYS OPENABLE FROM INT.

2-1-6 - 6 BUTT HINGES
STOREROOM LOCKSET-ALWAYS OPENABLE FROM INT.
INACTIVE LEAF W/ HEAD / FLOOR FINIS
ACTIVE LEAF WITH SURFACE ASTRAGAL

2-2-1 - 6 BUTT HINGES
PASSAGE LOCKSET
CLOSER WITH COORDINATOR
PANIC HARDWARE

2-2-2 - 3 BUTT HINGES
ENTRANCE LOCKSET
CLOSER
PANIC HARDWARE

1. ALL THRESHOLDS OF EXTERIOR DOORS SHALL BE NO MORE THAN 1/2" HIGH IN ACCORDANCE W/ THE FLORIDA BUILDING CODE - CHAPTER 11, ON HANDICAPPED ACCESSIBILITY.
2. ALL EXTERIOR DOORS SHALL BE MANUFACTURED IN ACCORDANCE W/ WIND PRESSURES NOTED ELSEWHERE IN THESE DRAWINGS AND WITH THE FLORIDA BUILDING CODE - CHAPTER 16.
3. ALL DOORS TO RECEIVE SILENCERS AND APPROPRIATE FLOOR OR WALL STOP.
4. VERIFY THAT LOCKING DEVICE IS INTEGRAL TO PANIC HARDWARE SUCH THAT UNLATCHING REQUIRES A SINGLE OPERATION IN ACCORDANCE WITH SECTION 1010.1.3.5 OF THE FBC-B
5. DOORS AND HARDWARE SHALL COMPLY WITH ALL APPLICABLE EGRESS FIRE PROTECTION AND ACCESSIBILITY REQUIREMENTS REPEATED IF THERE ARE ERRORS AND/OR OMISSIONS ON THE APPROVED PLANS.



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Goldenrod, FL 32733 C (321) 277-4128

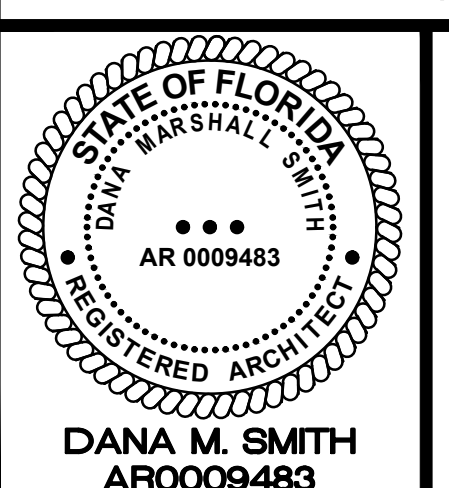
LOWE STRUCTURES, INC.
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(904) 992-0377
FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

[illegible]

DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
DOOR
SCHEDULE



SHEET #
A6.0

PROJECT # 02354.20	DATE: 6.3.2018
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FINISH SCHEDULE

[illegible]

FINISH MATERIALS:

FLOOR

C - CARPET TILES:
SP - SPORTS FLOOR
CT - CERAMIC TILE
RES - RESINOUS FLOOR
E - EXISTING TO REMAIN
SC - SEALED CONCRETE
P - POLISHED CONCRETE
T - ARTIFICIAL TURF

WALL

CT - CERAMIC TILE
BASIS OF DESIGN:
DALTILE 'CITYVIEW' PORCELAIN

GL - EXISTING GLAZING TO REMAIN

FRP - FIBER REINFORCED PLASTIC WAINSCOT

N - NONE

P CMU - PAINTED CMU

P - PAINTED GUBB w/ MEDIUM ORANGE FEEL FINISH

FS - PAINTED STUCCO

CEILING

AP - ACOUSTICAL PANELS:
E - EXISTING TO REMAIN
EXP - EXPOSED
P - PAINTED GWB w/ MEDIUM ORANGE PEEL FINISH

BASE

CT - CERAMIC TILE

E - EXISTING TO REMAIN
N - NONE
R - RUBBER BASE

FINISH NOTES

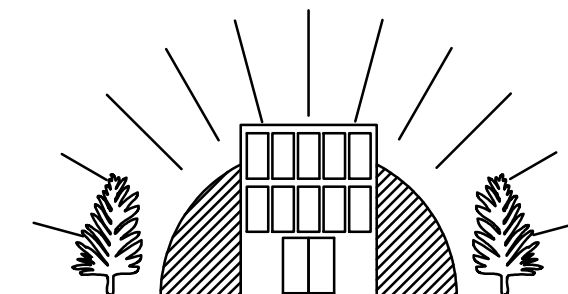
1. PAINT ALL NEW AND EXISTING DOORS AND FRAMES ON ALL SIDES.
2. IN SMALL UNNUMBERED ROOMS SUCH AS CLOSETS, STORAGE AREAS AND NOOKS, EXTEND FLOOR, WALL, AND CEILING FINISHES OF THE CONTIGUOUS SPACES INTO THESE AREAS.
3. WALLS AND PARTITIONS WITHIN 2 FT. (610 MM) OF SMOOTH (MOP) FINISH SURFACES OF CERAMIC OR URINAL SHALL HAVE SMOOTH HARD AND NON-ABSORBENT SURFACE, TO A HEIGHT OF NOT LESS THAN 4 FT. ABOVE THE FLOOR IN ACCORDANCE WITH SECTION 1202.22 OF FBC. MATERIALS USED FOR SUCH WALLS SHALL BE OF A TYPE THAT IS NON-POROUS, NON-FLAMMABLE, NON-TOXIC, PAINTED GUB, INCLUDING EPOXY PAINT, WILL NOT MEET THAT CRITERIA.



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A.Y.

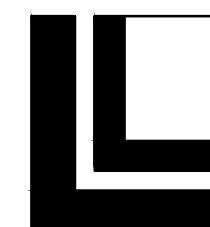
ARCHITECT.



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CONSULTANTS.



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EOR: J. Matthew Lowe FL PE: 59027

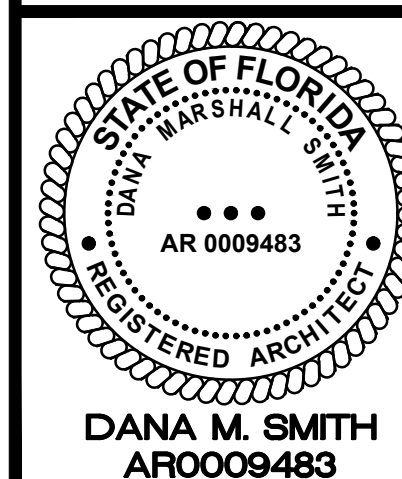
CONSULTANTS:

[illegible]

DRAWN BY: DJS
DESIGNED BY: DMS
REVIEWED BY: DMS

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
SCHEDULES



SHEET #
A6.1

PROJECT • 02354.20	DATE: 6.3.2018
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	1	2	3	4	5	6	7	
A								
B								
C								
D								
E								
	1	2	3	4	5	6	7	

FINISH SCHEDULE										
RM. NO.	ROOM NAME	FLOOR	BASE	N. WALL	E. WALL	S. WALL	W. WALL	CEILING	CEILING HEIGHT	NOTES
201	ELEVATOR LOBBY	SC	R	P	P	-	-	AP	9'-0"	.
202	LOUNGE	LVT	R	-	P	P	-	AP	9'-0"	.
202A	RAMP	LVT	R	P	P	P	P	AP	9'-0"	.
203	TEEN LOUNGE	LVT	R	P	P	-	P	AP	9'-0"	.
203A	VESTIBULE	LVT	R	P	-	-	P	AP	9'-0"	.
204	MECHANICAL	SC	R	P	P	P	P	P	9'-0"	.
									.	.
206	MULTI-PURPOSE #1	LVT	R	P	P	P	P	AP	10'-0"	.
207	MULTI-PURPOSE #2	LVT	R	P	P	P	P	AP	10'-0"	.
208	VESTIBULE	LVT	R	P	P	P	P	P	8'-0"	.
209	PARENT LOUNGE	LVT	R	P	P	P	P	AP	9'-0"	.
210	CLOSET	SC	R	P	P	P	P	AP	8'-0"	.
211	TOILET	CT	CT	P	CT	P	P	P	8'-0"	6'-0" H. WAINSCOTE ON WET WALL
212	STAFF	CT	CT	P	P	P	CT	P	8'-0"	6'-0" H. WAINSCOTE ON WET WALL
213	CONFERENCE ROOM	CPT	R	P	P	P	P	AP	10'-0"	.
214	VESTIBULE	LVT	R	P	-	P	P	AP	9'-0"	.
214A	LOBBY	LVT	R	P	-	P	P	AP	9'-0"	.
214B	CORRIDOR	LVT	R	P	-	P	P	AP	9'-0"	.
214C	CLOSET	LVT	R	P	P	P	P	P	8'-0"	.
215	POLICE ATHLETIC LEAGUE	C	R	P	P	P	P	AP	8'-0"	.
216	BREAK-OUT 'A'	LVT	R	P	P	P	P	AP	8'-6"	.
217	BREAK-OUT 'B'	LVT	R	P	P	P	P	AP	8'-6"	.
218	ELEVATOR LOBBY	SC	R	P CMU	P CMU	-	P CMU	EXP	9'-0"	.
219	TOILET	CT	CT	P	P	CT	P	AP	8'-0"	6'-0" H. WAINSCOTE ON WET WALL
220	MECHANICAL	SC	R	P	P CMU	P	P	EXP	.	.
221	OFFICE	C	R	P	P	P	P	AP	.	.
222	BREAK-OUT 'C'	LVT	R	P	P	P	P	AP	8'-0"	.
223	BREAK-OUT 'D'	LVT	R	P	P	P	P	AP	8'-0"	.

FINISH MATERIALS:

FLOOR

- C - CARPET TILES;
PS - PAINTED STUCCO
CT - CERAMIC TILE
RES - RESINOUS FLOOR
E - EXISTING TO REMAIN
SC - SEALED CONCRETE
P - POLISHED CONCRETE
T - ARTIFICIAL TURF

WALL

- CT - CERAMIC TILE
BASIS OF DESIGN:
DALTILE 'CITYVIEW' PORCELAIN
GL - EXISTING GLAZING TO REMAIN
FRP - FIBER REINFORCED PLASTIC WAINSCOT
N - NONE
P CMU - PAINTED CMU
P - PAINTED GUB w/ MEDIUM ORANGE PEEL FINISH
PS - PAINTED STUCCO

CEILING

- AP - ACOUSTICAL PANELS;
E - EXISTING TO REMAIN
EXP - EXPOSED
P - PAINTED GUB w/ MEDIUM ORANGE PEEL FINISH

BASE

- CT - CERAMIC TILE
BASIS OF DESIGN:
DALTILE 'CITYVIEW' PORCELAIN
E - EXISTING TO REMAIN
N - NONE
R - RUBBER BASE

FINISH NOTES

1. PAINT ALL NEW AND EXISTING DOORS AND FRAMES ON ALL SIDES.
2. IN SMALL UNNUMBERED ROOMS SUCH AS CLOSETS, STORAGE AREAS AND NOOKS, EXTEND FLOOR, WALL AND CEILING FINISHES OF THE CONTIGUOUS SPACES INTO THESE AREAS.

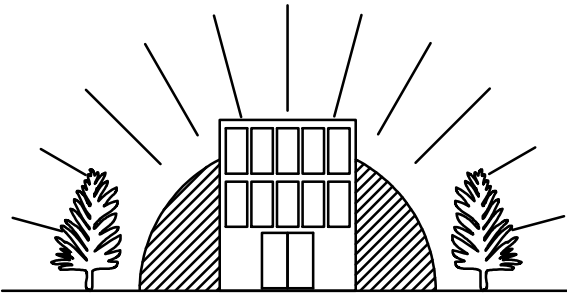
3. WALLS AND PARTITIONS WITHIN 2 FT. (610 MIN.) OF SERVICE (MOP) SINK, WATER CLOSET OR URINAL SHALL HAVE SMOOTH, HARD AND NON-ABSORBENT SURFACE, TO A HEIGHT OF NOT LESS THAN 4 FT. ABOVE THE FLOOR IN ACCORDANCE WITH SECTION 121022 OF FBGA. MATERIALS USED FOR SUCH WALLS SHALL BE OF A TYPE THAT IS NOT ADVERSELY AFFECTED BY MOISTURE. PAINTED GUB, INCLUDING EPOXY PAINT, WILL NOT MEET THAT CRITERIA.

dj

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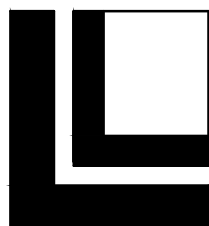
ARCHITECT.



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EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

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3	FINAL CONSTRUCTION DOCUMENTS	6.8.2020
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5	REVISED PERMIT SET	2.22.2021

DRAWN BY:	DJS
DESIGNED BY:	DMS
REVIEWED BY:	DMS

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
SCHEDULES

STATE OF FLORIDA
DANA MARSHALL SMITH
AR 0009483
REGISTERED ARCHITECT

DANA M. SMITH
AR0009483

SHEET #
A6.2

PROJECT # 02354.20 DATE: 6.3.2018

A

B

C

D

E

OUTSIDE AIR CALCULATION								
AREA SERVED	AREA (SQFT)	# PEOPLE	CFM / PERSON	PEOPLE OUTSIDE AIR (CFM)	CFM/SQFT	SQ.FT. OUTSIDE AIR (CFM)	TOTAL CFM CALCULATED	CFM SUPPLIED
100 LOBBY	383	10	5	50	0.06	23	73	150
101 RECEPTION	150	4	5	20	0.06	9	29	100
101A INDOOR PLAY	791	20	5	100	0.06	47	147	150
101C HALLWAY	488	0	-	-	0.06	29	29	50
101D HALLWAY	331	0	-	-	0.06	20	21	50
105 PUBLIC LOCKERS	831	25	5	125	0.06	50	175	175
106 SHARED OFFICE	110	3	5	15	0.06	7	22	50
108 OFFICE	108	3	5	15	0.06	6	21	50
109 ENTERTAINMENT	762	27	10	270	0.06	46	316	320
113 CONCESSION	122	3	5	15	0.06	7	22	25
114A ACTIVITY ROOM	1892	50	7.5	375	0.06	114	489	490
114B ACTIVITY ROOM	2112	50	7.5	375	0.06	127	501	505
117 OUTDOOR STOR.	563	-	-	-	0.12	68	68	75
120 GALLERY	397	16	7.5	120	0.06	24	144	145
121 OFFICE	113	3	5	15	0.06	7	22	50
122 OFFICE	126	3	5	15	0.06	8	23	50
123 CONFERENCE	288	15	5	75	0.06	17	92	100
124 STUDIO	378	8	10	80	0.18	68	148	150
125 STUDIO	378	8	10	80	0.18	68	148	150
126 STUDIO	369	8	10	80	0.18	66	146	150
127 P.A.L. STORAGE	383	-	-	-	0.12	46	46	50
128 STORAGE	275	-	-	-	0.12	33	33	50
131 WORK SPACE	935	15	5	75	0.06	56	131	135
202 LOUNGE	482	5	5	25	0.06	29	54	55
203 TEEN LOUNGE	189	5	5	25	0.06	11	36	50
206 MULTIPURPOSE	490	10	5	50	0.06	29	79	80
207 MULTIPURPOSE	412	10	5	50	0.06	26	76	80
208 VESTIBULE	313	-	-	-	0.06	19	19	25
209 PARENT LOUNGE	281	10	5	50	0.06	17	67	75
213 CONFERENCE	367	18	5	90	0.06	22	112	115
214 VESTIBULE	48	-	-	-	0.06	3	3	10
214B CORRIDOR	390	-	-	-	0.06	23	23	25
215 P.A.L.	445	10	5	50	0.06	27	77	80
216 BREAKOUT	523	10	5	50	0.06	31	81	85
217 BREAKOUT	651	10	5	50	0.06	39	89	90
221 OFFICE	135	3	5	15	0.06	8	23	50
222 BREAKOUT	167	5	5	25	0.06	10	35	50
223 BREAKOUT	192	5	5	25	0.06	12	37	40
TOTAL							3,657	4,120
PER TABLE 403.3.1.1 - FLORIDA BUILDING CODE 2017 - MECHANICAL BALANCE TO OUTSIDE AIR QUANTITIES SHOWN.								

AIR CURTAIN SCHEDULE							
MARK	CFM	MAX VELOCITY (FPM)	MOTOR HP	WEIGHT (LBS)	VOLTS/Ø	CONTROL	BASIS OF DESIGN
FF-1	1,340	3,226	1 @ 1/5	48	208/1	PLUNGER STYLE SWITCH	BERNER CLC08-1048A

MINI-SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE												
MARK	AREA SERVED	NOMINAL TONS	FAN		MCA	MOCP	WEIGHT (LBS.)	COOLING CAPACITY		SEER [EER]	EQUAL TO	
			CFM	V/Ø				TC (MBH)	SC (MBH)		MFG.	MODEL
AC-1	OUTDOOR STORAGE	2.0	700	208/1	1.0	-	50	-	-	-	DAIKIN	FXS24V2A
ACU-1	OUTDOOR STORAGE	2.0	-	208/1	17.1	20.0	120	31.4	22.5	19.0	DAIKIN	FXS24V2A
NOTES: 1. PROVIDE UNITS WITH FACTORY THERMOSTAT, SINGLE POINT ELECTRICAL CONNECTION. 2. PROVIDE 5 MINUTE ANTI CYCLE TIMER. 3. PROVIDE WITH FACTORY INSTALLED DISCONNECT. 4. PROVIDE UNIT WITH HAIL GUARD. 5. PROVIDE UNIT WITH CONDENSATE PUMP. 6. CFM BASED ON MEDIUM FAN SPEED. 7. BALANCE TO REQUIRED OUTSIDE AIR QUANTITY.												

LOUVER SCHEDULE					
MARK	SERVICE	SIZE		BIRD SCREEN	REMARKS
		LENGTH (IN)	HEIGHT (IN)		
L-1	SEE PLANS	20	16	YES	GREENHECK ESD-435X
L-2	SEE PLANS	24	12	YES	GREENHECK ESD-635X
L-3	SEE PLANS	24	14	YES	GREENHECK ESD-635X
NOTES: 1. PROVIDE HORIZONTAL, DRAINABLE ALUMINUM, BAKED ENAMEL FINISH. 2. MATCH COLOR OF LOUVER TO ADJACENT WALL COLOR.					

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE																						
MARK	AREA SERVED	TONS	INDOOR UNIT										COOLING CAPACITY		OUTDOOR UNIT					EQUAL TO		NOTES
			FAN				ELECTRIC HEATER		UNIT POWER			WEIGHT (LBS.)	TC (MBH)	SC (MBH)	UNIT POWER			WEIGHT (LBS.)	SEER [EER]	MFG.	MODEL	
			CFM	O/A	E.S.P. (IN.)	HP	KW	CONTROL STAGES	V/Ø	MCA	MOCP				V/Ø	MCA	MOCP					
AHU-1 / CU-1	GALLERY/OFFICE	5	2,000	480	0.8	1.0	10.0	1	460/3	19	20	250	58.0	46.4	460/3	10.7	15	250	14.5	LENNOX	CBX27UH-060 / TSA-060H4	SEE NOTES
AHU-2 / CU-2	STUDIOS	6	2,400	550	1.0	2.0	10.0	1	460/3	20	20	475	71.0	56.8	460/3	14.0	20	350	[11.2]	LENNOX	TAA072S4S / TSA-072S4	SEE NOTES
AHU-3 / CU-3	ACTIVITY ROOM	6	2,400	565	1.0	2.0	10.0	1	460/3	20	20	475	71.0	56.8	460/3	14.0	20	350	[11.2]	LENNOX	TAA072S4S / TSA-072S4	SEE NOTES
AHU-4 / CU-4	ACTIVITY ROOM	6	2,400	580	1.0	2.0	10.0	1	460/3	20	20	475	71.0	56.8	460/3	14.0	20	350	[11.2]	LENNOX	TAA072S4S / TSA-072S4	SEE NOTES
AHU-5 / CU-5	BREAKOUT	5	2,000	420	0.8	1.0	10.0	1	460/3	19	20	250	58.0	46.4	460/3	10.7	15	250	14.5	LENNOX	CBX27UH-060 / TSA-060H4	SEE NOTES
AHU-6 / CU-6	LOBBY	5	2,000	400	0.8	1.0	10.0	1	460/3	19	20	250	58.0	46.4	460/3	10.7	15	250	14.5	LENNOX	CBX27UH-060 / TSA-060H4	SEE NOTES
AHU-7 / CU-7	MULTIPURPOSE	6	2,400	480	1.0	2.0	10.0	1	460/3	20	20	475	71.0	56.8	460/3	14.0	20	350	[11.2]	LENNOX	TAA072S4S / TSA-072S4	SEE NOTES
AHU(E) / CU(E)	ADMIN. FIRST FLR.	10	4,000	645	-	2.0	-	-	460/3	-	-	-	-	-	460/3	23.3	35	450	-	-	-	-
NOTES: 1. PROVIDE UNITS WITH PROGRAMMABLE FACTORY THERMOSTAT. 2. PROVIDE 5 MINUTE ANTI CYCLE TIMER. 3. PROVIDE SMOKE DETECTOR IN SUPPLY DUCT AS INDICATED ON PLANS. 4. PROVIDE UNIT WITH HAIL GUARD. 5. PROVIDE WITH MANUFACTURER'S MOTOR AND DRIVE PACKAGE AS REQUIRED TO MEET SCHEDULED AIR CAPACITIES AND PRESSURE DROP. 6. PROVIDE UNITS WITH WATER-LEVEL MONITORING DEVICE. 7. PROVIDE CONTROLS TO ACTUATE OUTSIDE AIR CONTROL DAMPER OPEN UPON UNIT ACTIVATION AND CLOSE WHEN UNIT IF OFF. 8. PROVIDE CONSTRUCTION FILTERS FOR RETURN AIR OPENINGS DURING INSTALLATION. REPLACE FILTERS USED DURING CONSTRUCTION WITH NEW FILTERS. 9. PROVIDE MANUFACTURER RECOMMENDED CONDENSATE PUMP SYSTEM FOR EACH AIR HANDLING UNIT. 10. PROVIDE WITH HUMIDITROL DEHUMIDIFICATION SYSTEM.															ADD ALTERNATE #3 NOTE: 1. PROVIDE ULTRAVIOLET LIGHT KIT IN COIL SECTION OF AIR HANDLING UNIT. POWER LIGHT FROM UNIT.							

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE - ADD ALTERNATE #1																						
MARK	AREA SERVED	NOMINAL TONS	INDOOR UNIT									COOLING CAPACITY		OUTDOOR UNIT					EQUAL TO		NOTES	
			FAN				ELECTRIC HEATER		UNIT POWER			WEIGHT (LBS.)	TC (MBH)	SC (MBH)	UNIT POWER			WEIGHT (LBS.)	SEER [EER]	MFG.		MODEL
			CFM	O/A	E.S.P. (IN.)	HP	KW	CONTROL STAGES	V/Ø	MCA	MOCP				V/Ø	MCA	MOCP					
AHU-8 / CU-8	EXISTING GYM #1	25	10,000	-	0.6	5.0	-	-	460/3	8.38	15	2,130	318.0	296.0	460/3	49.0	60	1,000	[11.7]	TRANE	CSAA021 / TTA30044CAB	SEE NOTES
AHU-9 / CU-9	EXISTING GYM #2	25	10,000	-	0.6	5.0	-	-	460/3	8.38	15	2,130	318.0	296.0	460/3	49.0	60	1,000	[11.7]	TRANE	CSAA021 / TTA30044CAB	SEE NOTES
NOTES:																						
1. PROVIDE EQUIPMENT AS AN ADD ALTERNATE FROM BASE BID CONSTRUCTION DOCUMENTS.												11. CONTRACTOR TO VERIFY DIMENSIONS WITH EXISTING MECHANICAL SPACE PRIOR TO PURCHASE AND INSTALLATION.										
2. PROVIDE 5 MINUTE ANTI CYCLE TIMER.												12. PROVIDE WITH CONDENSER COIL HAIL/VANDAL GUARD KIT.										
3. PROVIDE TEST AND BALANCE ON EXISTING SYSTEM PRIOR TO INSTALLATION TO DETERMINE EXISTING PERFORMANCE CONDITIONS.												13. CONTRACTOR TO VERIFY EXISTING SYSTEM CHARACTERISTICS AND PROVIDE ANY ADDITIONAL CONTROLS AND/OR COMPONENTS AS NECESSARY TO BE AS PART OF THIS ADD ALTERNATE.										
4. PROVIDE CONNECTIONS TO EXISTING SYSTEM AS REQUIRED.																						
5. PROVIDE WITH MANUFACTURER'S MOTOR AND DRIVE PACKAGE AS REQUIRED TO MEET SCHEDULED AIR CAPACITIES AND PRESSURE DROP.																						
6. PROVIDE UNITS WITH WATER-LEVEL MONITORING DEVICE.																						
7. PROVIDE CONTROLS TO ACTUATE OUTSIDE AIR CONTROL DAMPER OPEN UPON UNIT ACTIVATION AND CLOSE WHEN UNIT IF OFF.																						
8. PROVIDE CONSTRUCTION FILTERS FOR RETURN AIR OPENINGS DURING INSTALLATION. REPLACE FILTERS USED DURING CONSTRUCTION WITH NEW FILTERS.																						
9. PROVIDE MANUFACTURER RECOMMENDED DRAIN PANS.																						
10. PROVIDE UNITS WITH PROGRAMMABLE FACTORY THERMOSTAT.																						

FAN SCHEDULE													
MARK	SERVICE	CFM	E.S.P. (IN. WATER)	FAN TYPE	DRIVE	SONES	HP (WATTS)	RPM	WEIGHT (LBS)	V/Ø	MANUFACTURER	MODEL	NOTES
EF-1	129 MEN	100	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-2	130 WOMEN	100	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-3	128A JANITOR	100	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-4	103 MEN	380	0.375	INLINE	DIRECT	8.1	1/8	1,550	60	115/1	GREENHECK	SQ-95-D	1-4
EF-5	102 WOMEN	280	0.375	INLINE	DIRECT	7.3	1/15	1,550	60	115/1	GREENHECK	SQ-80-D	1-4
EF-6	111 FAMILY	120	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-7	112 FAMILY	120	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-8	219 TOILET	100	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-9	204 PUBLIC	100	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
EF-10	212 STAFF	150	0.375	CEILING	DIRECT	3.5	128 WATTS	1,050	15	120/1	GREENHECK	SP-B150	1-4
NOTES: 1. PROVIDE INTEGRAL DISCONNECT SWITCH. 2. PROVIDE MANUFACTURER'S SPEED CONTROL MOUNTED AT UNIT. 3. PROVIDE CONTROL BY MANUAL LIGHT WITH OCCUPANCY SENSOR. COORDINATE WITH ELECTRICAL DRAWINGS FOR LOCATION OF SWITCH. 4. REFER TO MECHANICAL PLANS FOR LOCATION OF EXHAUST TERMINATION.													

AIR DEVICE SCHEDULE						
TAG	MFG./CAT. #	TYPE	NECK	FRAME	FINISH	NOTES
A	PRICE - ASCD	CD	SEE PLANS	12 x 12	BAK. WHT. ENAMEL	1,2,3,4,5
			SEE PLANS	24 x 24		
B	PRICE - 80	RAR	22 x 22 (MAX 1280 CFM)	24 x 24	BAK. WHT. ENAMEL	1,2,4,6
C	PRICE - 630	EAR/RAR	SEE PLANS	SEE PLANS	BAK. WHT. ENAMEL	1,2,4,6
D	PRICE - 620	SAR	SEE PLANS	SEE PLANS	BAK. WHT. ENAMEL	1,2,4,6

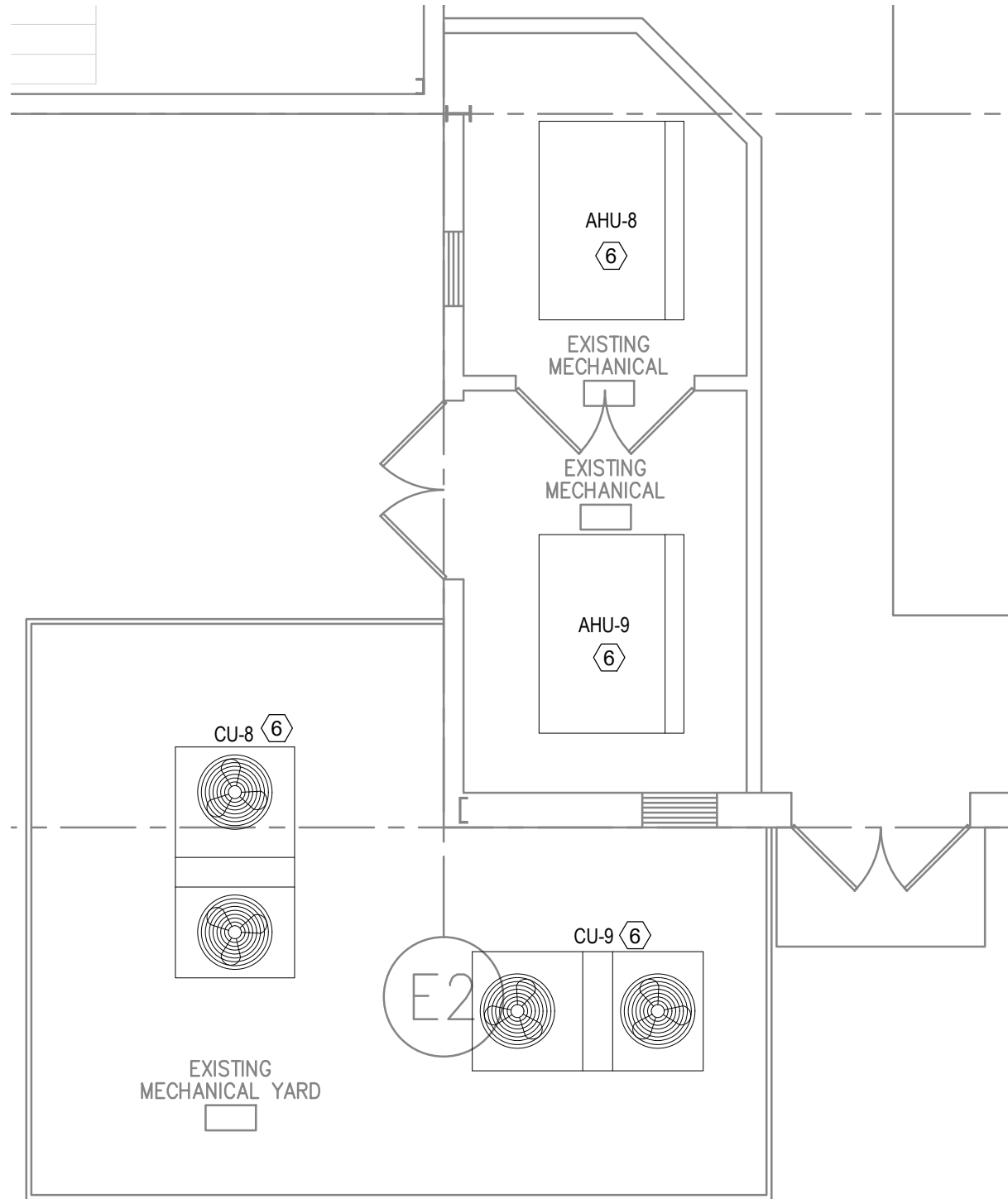
DEVICE TYPE LEGEND:
CD = CEILING DIFFUSER
RAR = RETURN AIR REGISTER
EAR = EXHAUST AIR REGISTER
SAR = SUPPLY AIR REGISTER

NOTES:

1. PROVIDE CEILING DEVICES WITH PROPER FRAME STYLE TO MATCH CEILING TYPE AS CALLED FOR BY ARCHITECT.
2. DEVICES SHALL BE PROVIDED WITH FACTORY FINISH.
3. CEILING DIFFUSERS SHALL BE 4-WAY THROW UNLESS NOTED OTHERWISE OR SHOWN ON PLANS WITH DIRECTIONAL ARROW(S).
4. IF NECESSARY, PROVIDE TOP HAT FOR GRILLES REGISTERS AND DIFFUSERS.
5. PROVIDE EQUALIZING GRID (PRICE MODEL FR) FOR DIFFUSERS TAPPED DIRECTLY FROM BOTTOM OF DUCT. PROVIDE OPPOSED BLADE DAMPER.
6. PROVIDE OPPOSED BLADE DAMPER FOR REGISTERS.

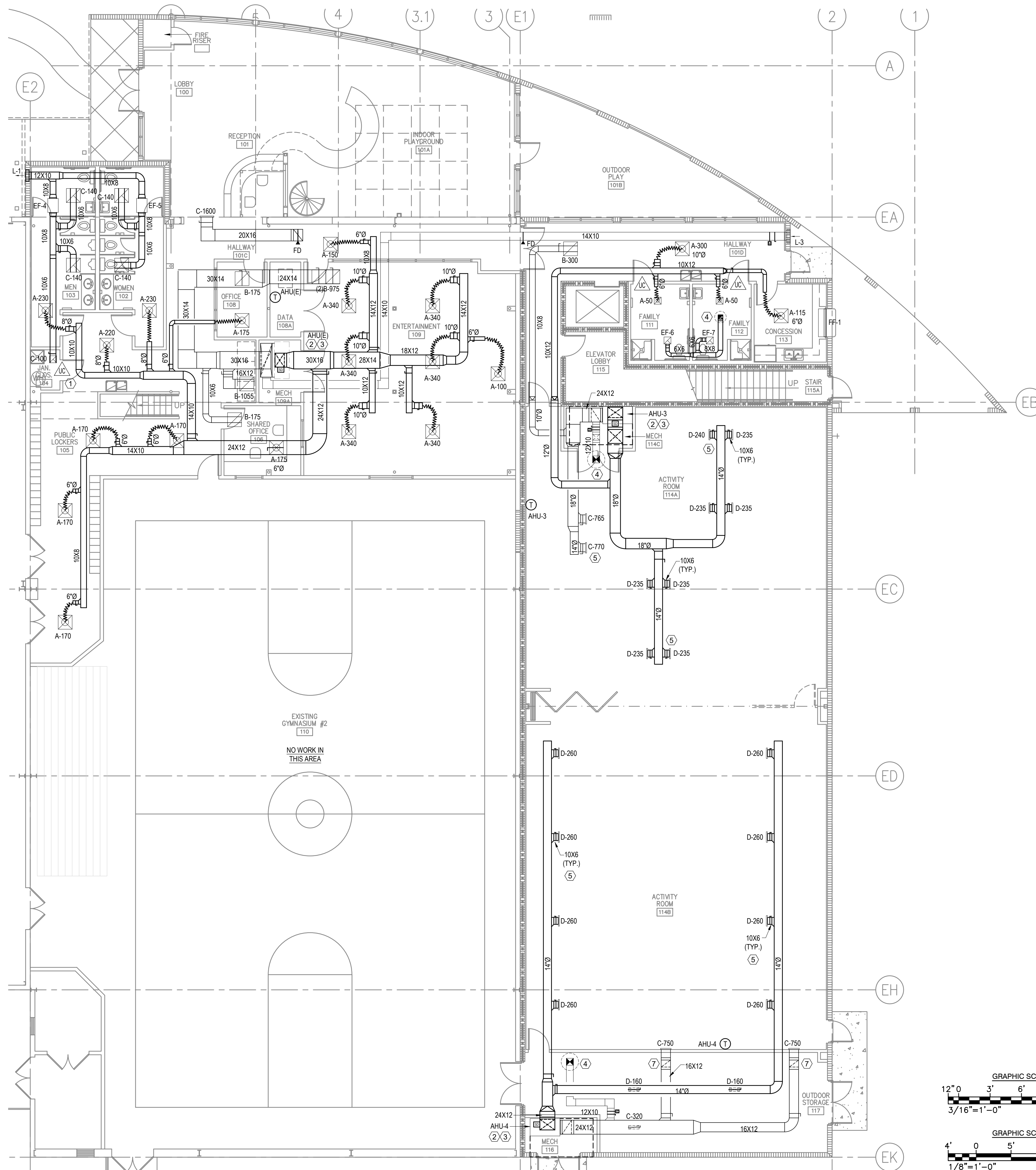
1. COORDINATE EXACT LOCATIONS OF MECHANICAL EQUIPMENT WITH ALL DISCIPLINES AND MAINTAIN REQUIRED CLEARANCES.
2. INSTALL FLEXIBLE CONNECTIONS BETWEEN ALL DUCTWORK AND MECHANICAL UNITS.
3. DUCTWORK CONNECTIONS TO EQUIPMENT TO BE SIZE OF UNIT OPENING.
4. PROVIDE BRANCH DUCT CONNECTIONS PER DETAIL ON SHEET M5.1.
5. COORDINATE ALL BRANCH DUCT LOCATIONS WITH STRUCTURAL JOIST OPENINGS.

- ① UNDERCUT DOOR 1" TO ALLOW FOR TRANSFER OF AIR.
- ② ROUTE CONDENSATE DRAIN PIPES BELOW SLAB TO EXTERIOR DRYWELL.
- ③ ROUTE REFRIGERANT PIPING TO ASSOCIATED CONDENSING UNIT ON THE ROOF. REFER TO REFRIGERANT PIPING SCHEMATIC DETAIL ON MECHANICAL DETAIL SHEET. COORDINATE EXACT LOCATION WITH ARCHITECTURAL PLANS.
- ④ UP TO GRAVITY VENTILATOR ON ROOF.
- ⑤ LOCATE BRANCH TAKE-OFF FOR SIDEWALL REGISTERS AT A 45° ANGLE (TYPICAL).
- ⑥ SEE SCHEDULE NOTES ON M0.2 FOR EQUIPMENT ADD ALTERNATE SPECIFICATIONS.
- ⑦ DROP RETURN DUCT DOWN AND CONNECT TO REGISTER TO WITH 24" OF FINISHED FLOOR FOR LOW WALL APPLICATION.



2
M1.1.

1
M1 1



GRAPHIC SCALE

12" 0' 3' 6' 9' 12' 15'

$\frac{3}{16}" = 1' - 0"$

GRAPHIC SCALE

4' 0' 5' 10' 15' 20'

$\frac{1}{8}" = 1' - 0"$

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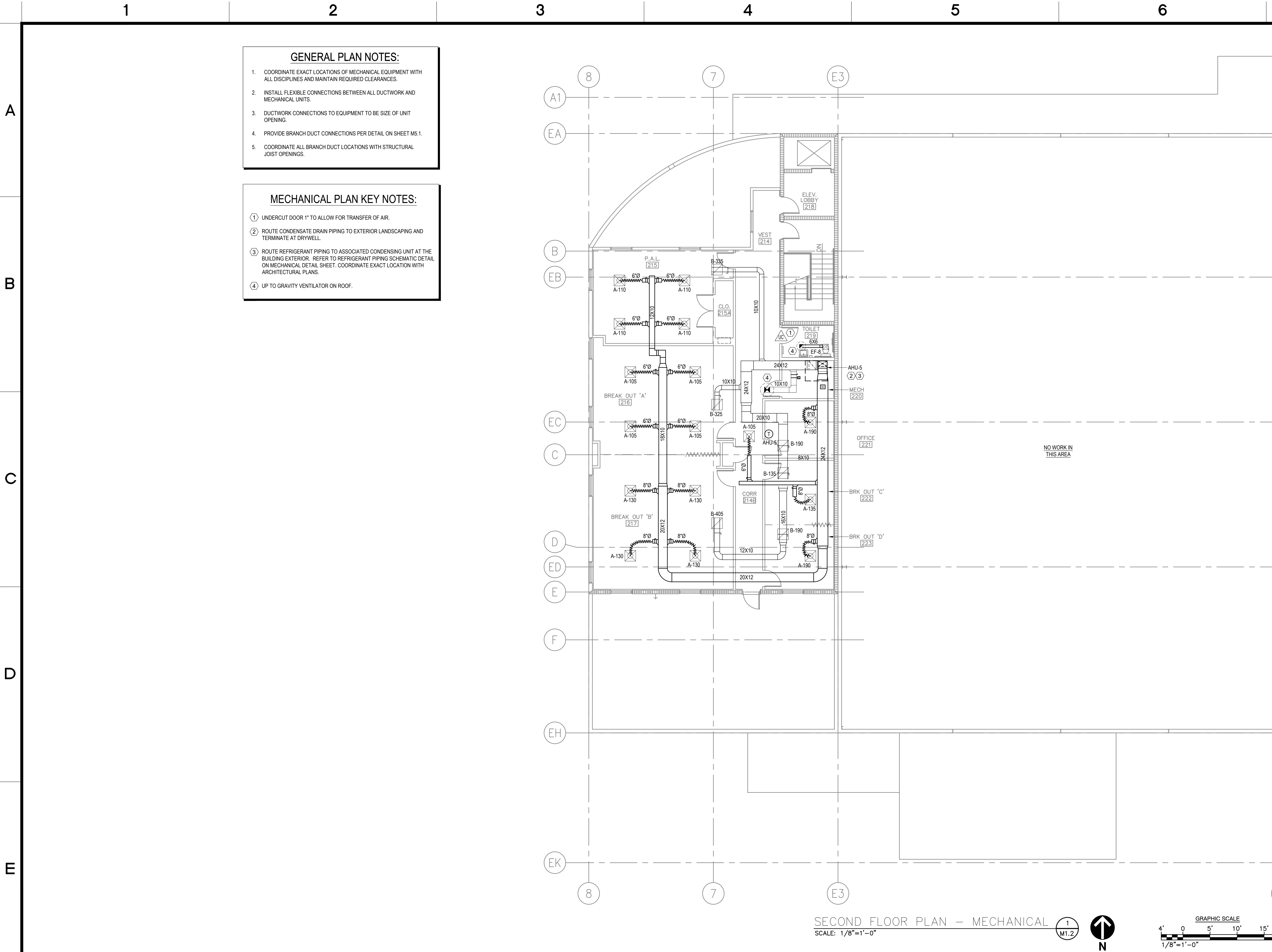
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1. *Journal of the American Medical Association*, 2000; 283: 2689-2694.

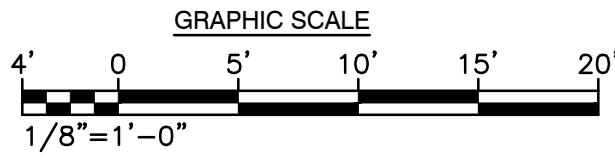
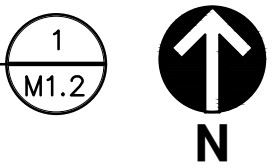
PROJECT #	020004	DATE:02.08.2020
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- GENERAL PLAN NOTES:**
- COORDINATE EXACT LOCATIONS OF MECHANICAL EQUIPMENT WITH ALL DISCIPLINES AND MAINTAIN REQUIRED CLEARANCES.
 - INSTALL FLEXIBLE CONNECTIONS BETWEEN ALL DUCTWORK AND MECHANICAL UNITS.
 - DUCTWORK CONNECTIONS TO EQUIPMENT TO BE SIZE OF UNIT OPENING.
 - PROVIDE BRANCH DUCT CONNECTIONS PER DETAIL ON SHEET M5.1.
 - COORDINATE ALL BRANCH DUCT LOCATIONS WITH STRUCTURAL JOIST OPENINGS.

- MECHANICAL PLAN KEY NOTES:**
- UNDERCUT DOOR 1" TO ALLOW FOR TRANSFER OF AIR.
 - ROUTE CONDENSATE DRAIN PIPING TO EXTERIOR LANDSCAPING AND TERMINATE AT DRYWELL.
 - ROUTE REFRIGERANT PIPING TO ASSOCIATED CONDENSING UNIT AT THE BUILDING EXTERIOR. REFER TO REFRIGERANT PIPING SCHEMATIC DETAIL ON MECHANICAL DETAIL SHEET. COORDINATE EXACT LOCATION WITH ARCHITECTURAL PLANS.
 - UP TO GRAVITY VENTILATOR ON ROOF.

SECOND FLOOR PLAN – MECHANICAL
SCALE: 1/8"=1'-0"



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ARCHITECT:

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FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	3.05.2021

DRAWN BY: KMO
DESIGNED BY: KMO
REVIEWED BY: MNO

PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**PARTIAL SECOND
FLOOR PLAN-MECHANICAL**

MINDY NICOLE O'NEAL
LICENSE
No 69779
★
STATE OF FLORIDA
PROFESSIONAL ENGINEER
MINDY N. O'NEAL
FL# 69779
PROJECT # 020004
DATE:02.08.2020

SHEET #
M1.2

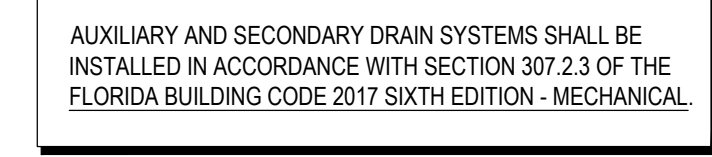


Diagram illustrating the components and dimensions of a roof drain assembly:

- COOLING COIL
- UNION
- THREADED CAP, HAND TIGHTENED
- THREADED CAP WITH 1/4" Ø HOLE DRILLED IN TOP, HAND TIGHTENED.
- DRAIN PAN
- CASING SLEEVE
- Dimensions: A, B, C
- SLOPE TO DRAIN

A = FULL SIZE OF UNIT DRAIN CONNECTION
B $\geq 1\frac{1}{2}$ TIMES FAN SUCTION STATIC PRESSURE
C $\geq$ FAN DISCHARGE STATIC PRESSURE PLUS 1/2 INCH

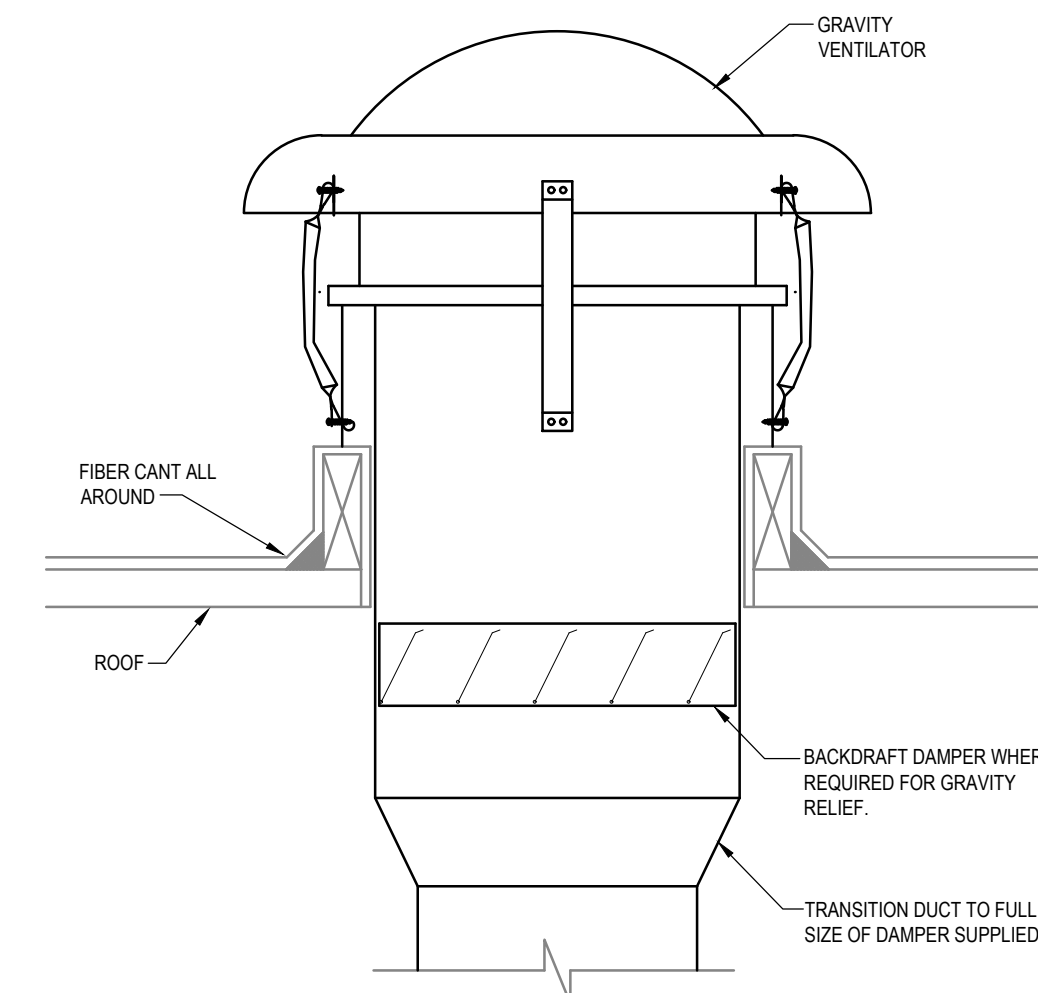
COORDINATE MOUNTING/CURB HEIGHT AS REQUIRED
TO PROVIDE PROPER CONDENSATE DRAINAGE.



3 Not Used

SCALE: NOT TO SCALE

4 Refrigerant Piping Schematic Detail



NOTE: CONTRACTOR TO PROVIDE ENGINEERED TIE-DOWN SOLUTION IN ACCORDANCE WITH SECTION 301.15 OF THE 2017 FLORIDA BUILDING CODE- MECHANICAL, SIXTH EDITION. PROVIDE A SIGNED AND SEALED CONNECTION DESIGN PER MANUFACTURERS SPECIFICATIONS PRIOR TO INSTALLATION. (3) COPIES OF PRODUCT APPROVAL INFORMATION TO BE SUPPLIED FOR MANUFACTURERS ENGINEERED TIE-DOWN SYSTEM.

ai. **DESIGN, INC.**

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[illegible]

A circular professional engineer seal for Mindy Nicole O'Neal. The outer ring contains the text "MINDY NICOLE O'NEAL" at the top and "PROFESSIONAL ENGINEER" at the bottom, separated by two stars. Inside the ring, the word "LICENSE" is at the top, "No 69779" is in the center, and "STATE OF FLORIDA" is at the bottom, also separated by two stars.

SHEET # M5.2

PROJECT #	020004	DATE:02.08.2020
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A

B

C

D

E

DRAWING INDEX	
SHEET NUMBER	TITLE
P0.1	Plumbing General Information
P0.2	Plumbing Schedules
P1.0	Partial First Floor Sanitary Plan
P1.1	Partial First Floor Sanitary Plan
P1.2	Partial Second Floor Sanitary Plan
P1.3	Partial Second Floor Sanitary Plan
P1.4	Plumbing Roof Plan
P2.0	Partial First Floor Domestic Water Plan
P2.1	Partial First Floor Domestic Water Plan
P2.2	Partial Second Floor Domestic Water Plan
P2.3	Partial Second Floor Domestic Water Plan
P5.1	Plumbing Details
P6.1	Sanitary Riser Diagrams
P6.2	Rainwater Riser Diagrams
P7.1	Domestic Water Riser Diagrams

SYMBOLS AND ABBREVIATIONS		
DESCRIPTION	ABBR.	SYMBOL
SANITARY PIPE ABOVE GRADE	SAN	_____
SANITARY PIPE BELOW GRADE	SAN	_____
FORCE MAIN ABOVE GRADE	FM	_____ FM _____
RAINWATER PIPE	RW	_____ RW _____
STORM WATER BELOW	ST	_____ ST _____
FILTERED WATER	FW	_____ FW _____
SOFT WATER	SW	_____ SW _____
COLD WATER PIPE	CW	_____ CW _____
HOT WATER PIPE	HW	_____ HW _____
HOT WATER RETURN	HWR	_____ HWR _____
CONDENSATE PIPE	C	_____ C _____
VENT PIPE	V	_____ V _____
GAS (NATURAL) PIPE	G	_____ G _____
CLEANOUT	CO	_____ CO _____
EXTERIOR CLEANOUT	ECO	_____ ECO _____
FLOOR CLEANOUT	FCO	_____ FCO _____
BACKWATER VALVE	BWV	_____ BWV _____
VENT THRU ROOF	VTR	_____ VTR _____
DIRECTION OF FLOW	-	_____ - _____
CAP	-	_____ CAP _____
TEE UP	-	_____ TEE UP _____
TEE DOWN	-	_____ TEE DOWN _____
ELBOW UP	-	_____ ELBOW UP _____
ELBOW DOWN	-	_____ ELBOW DOWN _____
REVISION REFERENCE	-	_____ REVISION REFERENCE _____
HOSE BIBB	-	_____ HOSE BIBB _____
CHECK VALVE	-	_____ CHECK VALVE _____
FLOOR DRAIN	-	_____ FLOOR DRAIN _____
FLOOR DRAIN OR FLOOR SINK	-	_____ FLOOR DRAIN OR FLOOR SINK _____
SHUT-OFF VALVE	-	_____ SHUT-OFF VALVE _____
BALANCING VALVE	-	_____ BALANCING VALVE _____
UNION	-	_____ UNION _____
RECIRCULATING PUMP	-	_____ RECIRCULATING PUMP _____
ROOF DRAIN	-	_____ ROOF DRAIN _____
CONNECT TO EXISTING	-	_____ CONNECT TO EXISTING _____
EXISTING	-	_____ EXISTING _____
ACCESS DOOR/PANEL	-	_____ ACCESS DOOR/PANEL _____
*SOME SYMBOLS SHOWN MAY NOT PERTAIN TO THIS PROJECT		

PLUMBING GENERAL NOTES	
1. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES AND GOVERNING AUTHORITIES INCLUDING: FLORIDA BUILDING CODE SIXTH EDITION - 2017, FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING, FBC SIXTH EDITION 2017- ENERGY CONSERVATION, FFPC SIXTH EDITION- 2017.	22. FURNISH AND INSTALL HOSE BIBBS AND/OR WALL HYDRANTS 24" ABOVE FINISHED GRADE/FLOOR (UNLESS OTHERWISE NOTED) AND PROVIDE VACUUM BREAKERS.
2. ALL SANITARY PIPING 2-1/2" OR LESS SHALL HAVE A 1/4" PER FOOT SLOPE. ALL SANITARY PIPING 3" OR LARGER SHALL HAVE A 1/8" PER FOOT SLOPE UNLESS OTHERWISE NOTED. ALL STORM WATER PIPING 2-1/2" OR LESS SHALL HAVE A 1/4" PER FOOT MINIMUM HORIZONTAL SLOPE. ALL STORM WATER PIPING 3" OR LARGER SHALL HAVE A 1/8" PER FOOT MINIMUM HORIZONTAL SLOPE UNLESS OTHERWISE INDICATED.	23. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF ROOF DRAINS, PLUMBING FIXTURE MOUNTING HEIGHTS AND DIMENSIONS.
3. VALVES AND FITTINGS SHALL BE OF SAME SIZE OF PIPE ON WHICH THEY ARE LOCATED, UNLESS OTHERWISE INDICATED ON DRAWINGS.	24. CONTRACTOR SHALL VERIFY INVERT ELEVATIONS OF EXISTING SEWERS IN WHICH NEW SEWER LINES ARE TO BE CONNECTED PRIOR TO STARTING WORK.
4. INSTALL WATER HAMMER SHOCK ARRESTORS AT EACH FIXTURE OR BATTERY OF FIXTURES WHERE REQUIRED. ARRESTORS SHALL BE FACTORY FABRICATED. INSTALL ARRESTORS AND SIZE PER PLUMBING AND DRAINAGE INSTITUTE STANDARD P.D.I. WH-201. ACCEPTABLE MANUFACTURERS: JOSAM, WATTS AND SIOUX CHIEF. AIR CHAMBERS SHALL NOT BE CONSIDERED AN EQUAL TO WATER ARRESTORS AS SPECIFIED.	25. CONTRACTOR SHALL INSTALL DIELECTRIC UNIONS AT CONNECTIONS OF DISSIMILAR METALS.
5. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING FIRE RATING AND WEATHERPROOFING INTEGRITY OF ALL PIPE PENETRATIONS.	26. CONTRACTOR SHALL ROUGH-IN ALL WASTE AND SUPPLIES TO SPECIAL EQUIPMENT ACCORDING TO MANUFACTURER'S SHOP DRAWINGS AND MAKE FINAL CONNECTIONS AS NOTED. ALL SUPPLIES SHALL BE VALVED. INSTALL VACUUM BREAKERS WHERE REQUIRED BY CODE.
6. ALL WATER SUPPLY AND SANITARY LINES SHALL RUN AS CLOSE TO PLANS AS POSSIBLE WITH NO CHANGES IN SIZING.	27. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS (INCLUDING PIPE ROUTING AND EQUIPMENT LOCATIONS) TO ARCHITECT/ENGINEER FOR REVIEW PRIOR TO THE INSTALLATION OR PURCHASING OF ANY PIPING AND/OR EQUIPMENT.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY SUPPORTING DEVICES FOR FIXTURES.	28. PROVIDE REDUCED PRESSURE BACKFLOW PREVENTERS FOR DOMESTIC WATER SUPPLY CONNECTIONS AS REQUIRED BY CODE.
8. CHANGES IN THE DIRECTION OF SANITARY AND STORM DRAINAGE PIPING SHALL NOT BE MADE WITH FITTINGS WHICH WILL CAUSE EXCESSIVE REDUCTION IN THE VELOCITY OF FLOW OR CREATE ANY OTHER ADVERSE EFFECT. I.E.: USE OF SANITARY TEE IN A HORIZONTAL CONNECTION, USE OF A DOUBLE SANITARY TEE IN A VERTICAL STACK, USE OF SHORT RADIUS FITTINGS FOR BRANCH TO HOUSE DRAIN OR STACK CONNECTION.	29. ALL BELOW GRADE/SLAB COPPER PIPE SHALL BE PLACED WITHIN COPPER PIPE SLEEVE (10 MIL) POLYETHYLENE PLASTIC SLEEVING. EXTEND SLEEVING ABOVE GRADE/SLAB.
9. CONTRACTOR SHALL GIVE 24 HOURS NOTICE TO APPLICABLE UTILITY COMPANY PRIOR TO PERFORMING WORK INVOLVING UTILITIES.	30. CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF FLOOR DRAINS LOCATED IN TOILET ROOMS. PLUMBING CONTRACTOR SHALL COORDINATE EXACT LOCATION OF FLOOR DRAINS SERVING MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION.
10. WHERE SANITARY SEWER LINES CROSS UNDERGROUND WATER SUPPLY LINES THE INSTALLATION SHALL COMPLY WITH THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING.	31. PRESSURE REDUCING VALVES SHALL BE INSTALLED ON BRANCH LINES SERVING FIXTURES AND/OR EQUIPMENT WHEN THE PRESSURE IN THE LINE EXCEEDS 80 P.S.I.
11. ALL FLOOR DRAINS SHALL BE PROVIDED WITH A TRAP PRIMER VALVE AND FITTINGS UNLESS NOTED OTHERWISE.	32. COORDINATE ROUTING OF ALL PLUMBING SYSTEMS TO AVOID CONFLICTS WITH OTHER DISCIPLINES WITHIN INTERSTITIAL SPACE AND ROUTE TIGHT TO STRUCTURE WHERE POSSIBLE. PIPING SHALL NOT ENTER OR PASS THROUGH ELECTRICAL AND COMMUNICATION ROOMS.
12. THE PLUMBING CONTRACTOR MAY BE REQUIRED TO DROP PIPE OUTSIDE OF BUILDING TO REQUIRED DEPTH TO PROVIDE CONNECTION TO AREA DEVELOPMENT UTILITY STUB. ALL DROPS IN DEPTH SHALL BE MADE WITH THE USE OF 45° FITTINGS.	33. IF THE INTENT OF THE DRAWINGS AND/OR SPECIFICATIONS IS UNCLEAR OR HAS MORE THAN ONE INTERPRETATION, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER IN WRITING BEFORE THE SUBMISSION OF BIDS. THE ARCHITECT/ENGINEER SHALL MAKE CORRECTIONS AND/OR PROVIDE EXPLANATION IN WRITING.
13. ROUTE ALL PIPING CONCEALED ABOVE CEILINGS, WITHIN WALLS, OR IN CHASES. EXPOSED PIPING SHALL BE SLOPED AND PAINTED TO MATCH ARCHITECTURAL FINISHES. PIPING IN MECHANICAL ROOMS MAY BE EXPOSED.	34. PLANS AND SPECIFICATIONS ARE INTENDED AS A GENERAL DESCRIPTION OF THE WORK TO BE PERFORMED. ALL ITEMS NOT SPECIFICALLY MENTIONED OR SHOWN, BUT NECESSARY FOR THE COMPLETION OF THE INSTALLATION, SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR. THE CONTRACTOR SHALL ACQUAINT HIMSELF WITH THE MECHANICAL, ARCHITECTURAL, STRUCTURAL AND ELECTRICAL PLANS PRIOR TO SUBMITTING HIS FINAL BID. NO ADDITIONAL COMPENSATION WILL BE ALLOWED DUE TO CONTRACTORS' FAILURE TO FAMILIARIZE HIMSELF WITH THE PLANS.
14. ALL PENETRATIONS OF RATED WALLS, FLOORS, CEILINGS, ETC., SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 714 OF THE FBC SIXTH EDITION - 2017 TO MAINTAIN RATINGS. REFER TO ARCHITECTURAL DRAWINGS FOR APPLICABLE UL STANDARDS AND LOCATIONS OF RATED WALLS, CEILINGS, FLOORS, ETC.	35. THE CONTRACTOR SHALL BASE HIS PROPOSAL UPON THE EQUIPMENT AS SCHEDULED OR SPECIFIED, USING THE MANUFACTURERS AND EQUIPMENT SPECIFIED ON THE DRAWINGS. IF MORE THAN ONE MANUFACTURER IS SPECIFIED FOR ONE ITEM, ANY ONE OF THE MANUFACTURERS LISTED MAY BE USED IN THIS CONTRACTOR'S PROPOSAL. IF THIS CONTRACTOR WISHES TO USE EQUIPMENT NOT SPECIFIED, HE MUST AT THE TIME OF BIDDING SUBMIT SEPARATELY ON LETTERHEAD STATIONARY OF THE BIDDER, THE EQUIPMENT HE WOULD SUBSTITUTE AND THE COST TO BE ADDED OR TO BE DEDUCTED FROM HIS PROPOSAL. CONTRACTOR'S PROPOSED SUBSTITUTES SHALL BE SUBMITTED TO ARCHITECT AND APPROVED BY OWNER.
15. ALL WATER PIPING INSTALLED IN EXTERIOR WALLS SHALL BE PLACED ON THE INTERIOR SIDE OF THE WALL. THE WALL INSULATION SHALL BE PLACED ON THE EXTERIOR SIDE OF THE PIPE.	36. THE CONTRACTOR IS EXPECTED TO ORDER ALL MATERIALS IN SUFFICIENT TIME TO AVOID DELAYING THE COMPLETION OF THE PROJECT. DELAY IN DELIVERY WILL NOT BE CONSIDERED A JUSTIFIABLE REASON FOR SUBMISSION OF SUBSTITUTE MATERIALS.
16. SEE RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.	37. DO NOT PENETRATE WALL FOOTINGS WITH PIPING. COORDINATE PENETRATION LOCATION WITH GENERAL CONTRACTOR. PIPE PENETRATING A BEARING WALL OR FOOTING MUST BE SLEEVED AND LOCATION APPROVED BY STRUCTURAL ENGINEER.
17. COLD AND HOT WATER PIPING SHALL BE CHLORINATED POLYVINYL CHLORIDE (CPVC) SCHEDULE 40 PLASTIC PIPE AND TUBING (ASTM F441) WITH CPVC SCHEDULE 40 FITTINGS (ASTM F438) SOCKET TYPE. DISINFECT WATER PIPING AFTER PRESSURE TEST. DISINFECTION PROCEDURE SHALL COMPLY WITH THE LOCAL HEALTH AUTHORITY, LOCAL WATER PURVEYOR, FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING, SECTION 610 DISINFECTION OF POTABLE WATER SYSTEMS.	38. REFER TO PLANS FOR VENT THRU ROOF (VTR) PIPE SIZES AND LOCATIONS. LOCATE VTR A MINIMUM OF 10' OF HORIZONTAL DISTANCE FROM ANY BUILDING OPENING OR FRESH AIR INTAKE. EXTEND VTR 12" ABOVE ROOF SURFACE. PROVIDE 1" FIBERGLASS INSULATION WITH ALL-SERVICE JACKET ON VENT PIPE INSIDE BUILDING WITHIN 6' OF VTR LOCATION. VERIFY FLASHING AND COUNTERFLASHING AND COORDINATE INSTALLATION WITH ROOFING CONTRACTOR.
18. SOIL, WASTE, VENT PIPING AND FITTINGS SHALL BE PVC: ASTM D2665 SCHEDULE 40. JOINTS SHALL BE SOLVENT CEMENT. PROVIDE CAST IRON PIPE AND FITTINGS FOR SOIL, WASTE AND VENT PIPING LOCATED IN CEILING PLENUMS OR IN LOCATIONS OF HIGH TEMPERATURE WATER DISCHARGE IN THE KITCHEN AND LAUNDRY.	39. COORDINATION: CONTRACTOR SHALL COORDINATE ITS CONSTRUCTION OPERATIONS WITH THOSE OF OTHER CONTRACTORS AND ENTITIES TO ENSURE EFFICIENT AND ORDERLY INSTALLATION OF EACH PART OF THE WORK. CONTRACTOR SHALL COORDINATE ITS OPERATIONS WITH OTHER CONTRACTORS OPERATIONS, THAT DEPEND ON EACH OTHER FOR PROPER INSTALLATION, CONNECTION AND OPERATION.
19. PROVIDE CLEANOUTS FOR SANITARY AND STORM PIPING AT BASE OF EACH VERTICAL STACK, AT EACH CHANGE OF DIRECTION OF HORIZONTAL PIPE RUNS AND AT 100 FOOT INTERVALS OF HORIZONTAL RUNS FOR SANITARY AND STORM PIPING.	40. HEAT-TRACED PIPING SHALL MEET INSULATION THICKNESS REQUIREMENTS PER FLORIDA BUILDING CODE SIXTH EDITION 2017 - ENERGY CONSERVATION.
20. PROVIDE ACCESS PANELS TO VALVES WITHIN CHASES, WALLS, OR ABOVE NON-ACCESSIBLE CEILINGS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES. SEE SPECIFICATION SECTION 220553 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT FOR ENGRAVED LABELS FOR ALL ACCESS PANELS, VALVES, PLUMBING EQUIPMENT, ETC. PROVIDE ENGRAVED LABEL ON CEILING GRID AT EQUIPMENT LOCATION.	
21. SITE UTILITY CONNECTIONS SHOWN ON CIVIL DRAWINGS. ALL SERVICES SHOWN ON THIS SET OF PLANS TERMINATE 5'-0" FROM BUILDING, UNLESS SHOWN OTHERWISE ON DRAWINGS.	

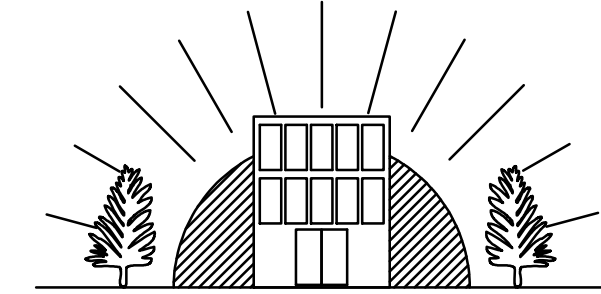
SUBMITTALS AND SUBSTITUTIONS	
1. CONTRACTOR SHALL SUBMIT THE FOLLOWING EQUIPMENT FOR REVIEW PRIOR TO ORDERING AND INSTALLING. A. PLUMBING FIXTURES B. WATER HEATERS C. RECIRCULATION PUMPS D. PIPING	
2. PROCESSING TIME: ALLOW 10 WORKING DAYS FOR REVIEW OF EACH SUBMITTAL. ALLOW ADDITIONAL TIME IF COORDINATION WITH SUBSEQUENT SUBMITTALS IS REQUIRED. ENGINEER WILL ADVISE CONTRACTOR WHEN A SUBMITTAL BEING PROCESSED MUST BE DELAYED FOR COORDINATION.	
3. SUBMITTALS: PLACE A PERMANENT LABEL OR TITLE BLOCK ON EACH SUBMITTAL ITEM FOR IDENTIFICATION. INDICATE NAME OF FIRM OR ENTITY THAT PREPARED EACH SUBMITTAL ON LABEL OR TITLE BLOCK. PROVIDE A SPACE BESIDE TITLE BLOCK TO RECORD CONTRACTOR'S REVIEW AND APPROVAL. MARKINGS AND ACTION TAKEN BY ENGINEER. INCLUDE THE FOLLOWING INFORMATION FOR PROCESSING AND RECORDING ACTION TAKEN: A. PROJECT NAME. B. DATE. C. NAME OF ENGINEER. D. NAME OF CONTRACTOR. E. NAME OF SUBCONTRACTOR. F. NAME OF SUPPLIER. G. NAME OF MANUFACTURER. H. DRAWING NUMBER AND DETAIL REFERENCES, AS APPROPRIATE. I. LOCATION WHERE PRODUCT IS TO BE INSTALLED, AS APPROPRIATE.	
4. SUBMIT ELECTRONIC SUBMITTALS VIA EMAIL AS PDF ELECTRONIC FILES.	
5. PAPER SUBMITTALS: SUBMIT THREE PAPER COPIES OF EACH SUBMITTAL UNLESS OTHERWISE INDICATED. ENGINEER WILL RETURN TWO COPIES.	
6. COLLECT SUBMITTAL DATE INFORMATION INTO A SINGLE SUBMITTAL FOR EACH ELEMENT OF CONSTRUCTION AND TYPE OF PRODUCT OR EQUIPMENT. MARK EACH COPY OF EACH SUBMITTAL TO SHOW WHICH PRODUCTS AND OPTIONS ARE APPLICABLE. INCLUDE THE FOLLOWING INFORMATION, AS APPLICABLE: A. MANUFACTURER'S CATALOG CUTS. B. MANUFACTURER'S PRODUCT SPECIFICATIONS. C. STATEMENT OF COMPLIANCE WITH SPECIFIED REFERENCED STANDARDS. D. NOTATION OF COORDINATION REQUIREMENTS. E. WIRING DIAGRAMS SHOWING FACTORY-INSTALLED WIRING. F. PRINTED PERFORMANCE CURVES. G. OPERATIONAL RANGE DIAGRAMS. H. CLEARANCES REQUIRED TO OTHER CONSTRUCTION, IF NOT INDICATED ON ACCOMPANYING SHOP DRAWINGS.	
7. CONTRACTOR SHALL REVIEW EACH SUBMITTAL AND CHECK FOR COORDINATION WITH OTHER WORK OF THE CONTRACT AND FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS. NOTE CORRECTIONS AND FIELD DIMENSIONS. MARK WITH APPROVAL STAMP BEFORE SUBMITTING TO ENGINEER. APPROVAL STAMP: STAMP SHALL STATE THAT SUBMITTAL HAS BEEN REVIEWED, CHECKED, AND APPROVED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND INITIALLED AND DATED BY CONTRACTOR.	
8. ENGINEER WILL REVIEW EACH SUBMITTAL. MAKE MARKS TO INDICATE CORRECTIONS OR REVISIONS REQUIRED, AND RETURN IT. ENGINEER WILL STAMP EACH SUBMITTAL WITH AN ACTION STAMP AND WILL MARK STAMP APPROPRIATELY TO INDICATE ACTION.	
9. ENGINEER WILL NOT REVIEW SUBMITTALS THAT DO NOT BEAR CONTRACTOR'S APPROVAL STAMP AND INITIALS AND WILL RETURN THEM WITHOUT ACTION. INCOMPLETE SUBMITTALS ARE UNACCEPTABLE. WILL BE CONSIDERED NONRESPONSIVE, AND WILL BE RETURNED FOR RESUBMITTAL WITHOUT REVIEW. SUBMITTALS NOT REQUIRED BY THE CONTRACT DOCUMENTS MAY NOT BE REVIEWED AND MAY BE DISCARDED	
10. SUBSTITUTIONS A. SUBSTITUTION OFFERS OWNER A SUBSTANTIAL ADVANTAGE IN COST, TIME, ENERGY CONSERVATION, OR OTHER CONSIDERATIONS. B. SUBSTITUTION DOES NOT REQUIRE EXTENSIVE REVISIONS TO THE CONTRACT DOCUMENTS. CONTRACTOR SHALL COMPENSATE ENGINEER FOR ANY REDESIGN AND EVALUATION SERVICES INCLUDING CHANGES REQUIRED BY AUTHORITY HAVING JURISDICTION. C. SUBSTITUTION WILL NOT ADVERSELY AFFECT CONSTRUCTION SCHEDULE. D. SUBSTITUTION HAS RECEIVED NECESSARY APPROVALS OF AUTHORITIES HAVING JURISDICTION. E. SUBSTITUTION HAS BEEN COORDINATED WITH OTHER PORTIONS OF THE WORK. F. SUBSTITUTION PROVIDES SPECIFIED WARRANTY. G. SUBSTITUTION HAS BEEN COORDINATED WITH OTHER PORTIONS OF THE WORK, AND IS ACCEPTABLE TO ALL CONTRACTORS INVOLVED. H. CONTRACTOR SHALL ASSUME ANY ADDITIONAL CONSTRUCTION COSTS AS A RESULT OF THE SUBSTITUTION.	

FLORIDA BUILDING CODE SIXTH EDITION (2017) ENERGY CONSERVATION COMPLIANCE	
THE DESIGN COMPLIES WITH SECTION C401.2 APPLICATION ITEM 3:	
THE REQUIREMENTS OF SECTION C402.5, C403.2, C404, C405.2, C405.3, C405.5, C405.6 AND C407. THE BUILDING ENERGY COST SHALL BE EQUAL TO OR LESS THAN 85 PERCENT OF THE STANDARD REFERENCE DESIGN BUILDING.	

WATER HAMMER ARRESTOR SCHEDULE	
INSTALLED ARRESTOR SHALL BE APPROVED DEVICE BY FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING. = ALL SUPPLY PIPING SHALL HAVE ARRESTOR THE SAME SIZE AS CONNECTION SIZE UP TO 1" I.E. PROVIDE P.D.I. SIZE "C" FOR 1" OR LARGER WATER SUPPLY TO FIXTURES, P.D.I. SIZE "B" FOR 3/4" SUPPLY AND P.D.I. SIZE "A" FOR 1/2" SUPPLY.	
* P.D.I. SIZE	CONNECTION SIZE
A (1-11 F.U.)	1/2"
B (12-32 F.U.)	3/4"
C (33-60 F.U.)	1"
P.D.I. = PLUMBING AND DRAINAGE INSTITUTE STANDARD WH-201	

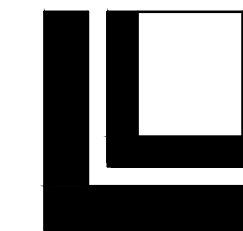


ARCHITECT:



DELOSE O'NEAL ENGINEERING
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CONSULTANTS:



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11651 Central Parkway, Suite 106 Jacksonville, FL 32224 (904) 992-0377
FL Cert of Auth: 28261 EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	3.05.2021

DRAWN BY: KMO
DESIGNED BY: KMO
REVIEWED BY: MNO

PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**PLUMBING
GENERAL INFORMATION**

	SHEET # P.O.1
PROJECT # 020004 DATE: 02.08.2020	

A

B

C

D

E

FIXTURE SPECIFICATIONS								
TAG	FIXTURE	MANUFACTURER	MODEL #	PIPE SIZE				DESCRIPTION
				CW	HW	SAN	VENT	
WC-1	WATER CLOSET FLUSH TANK	AMERICAN STANDARD	A211AA104020	1/2"	-	4"	2"	ADA COMPLIANT, VITREOUS CHINA, 2-PIECE CONSTRUCTION TANK-TYPE, 1.28 GPF, ELONGATED BOWL WATER CLOSET WITH PISTON-ACTION FLUSH VALVE. PROVIDE WITH MANUFACTURERS RECOMMENDED ANGLE SUPPLY STOPS, SUPPLY TUBING AND INSTALLATION MATERIALS. PROVIDE ANTIMICROBIAL OPEN FRONT COVERLESS SEAT.
WC-2	WATER CLOSET FLUSH TANK	AMERICAN STANDARD	A211AA104020	1/2"	-	4"	2"	VITREOUS CHINA, 2-PIECE CONSTRUCTION TANK-TYPE, 1.28 GPF, ELONGATED BOWL WATER CLOSET WITH PISTON-ACTION FLUSH VALVE. PROVIDE WITH MANUFACTURERS RECOMMENDED ANGLE SUPPLY STOPS, SUPPLY TUBING AND INSTALLATION MATERIALS. PROVIDE ANTIMICROBIAL OPEN FRONT COVERLESS SEAT.
UR-1	URINAL	AMERICAN STANDARD	6590.501	3/4"	-	2"	1-1/2"	ADA COMPLIANT WALL HUNG VITREOUS CHINA URINAL, 0.5 GPF, 3/4" INLET TOP SPUD, FLUSHING RIM. PROVIDE WITH MANUFACTURERS MANUAL FLUSH VALVE, WALL MOUNTING HARDWARE, ANGLE SUPPLY STOPS, SUPPLY TUBING AND INSTALLATION MATERIALS. REFER TO ARCHITECTURAL DRAWINGS FOR ADA MOUNTING HEIGHT.
UR-2	URINAL	AMERICAN STANDARD	6590.501	3/4"	-	2"	1-1/2"	WALL HUNG VITREOUS CHINA URINAL, 0.5 GPF, 3/4" INLET TOP SPUD, FLUSHING RIM. PROVIDE WITH MANUFACTURERS MANUAL FLUSH VALVE, WALL MOUNTING HARDWARE, ANGLE SUPPLY STOPS, SUPPLY TUBING AND INSTALLATION MATERIALS. REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHT.
L-1	LAVATORY WALL HUNG	AMERICAN STANDARD	0355.012	1/2"	1/2"	2"	1-1/2"	ADA COMPLIANT WALL HUNG VITREOUS LAVATORY. PROVIDE ANGLE SUPPLIES, P-TRAP, PIPING INSULATION WRAP, DRAIN GRID AND INSTALLATION MATERIALS. INSTALL AS REQUIRED TO MEET ADA GUIDELINES. PROVIDE AMERICAN STANDARD FAUCET 6055.105 BATTERY INCLUDED WITH THERMOSTATIC MIXING VALVE 605XTM/1070. INSTALL USING MANUFACTURERS RECOMMENDATIONS.
L-2	LAVATORY COUNTERTOP	AMERICAN STANDARD	0419.444	1/2"	1/2"	2"	1-1/2"	DROP IN SELF RIMMING VITREOUS LAVATORY. PROVIDE ANGLE SUPPLIES, P-TRAP, PIPING INSULATION WRAP, DRAIN GRID AND INSTALLATION MATERIALS. INSTALL AS REQUIRED TO MEET ADA GUIDELINES. PROVIDE AMERICAN STANDARD FAUCET 6055.105 BATTERY INCLUDED WITH THERMOSTATIC MIXING VALVE 605XTM/1070. INSTALL USING MANUFACTURERS RECOMMENDED INSTALLATION INSTRUCTIONS.
S-1	SINK COUNTERTOP (SINGLE BOWL)	ELKAY	DLR252210	1/2"	1/2"	2"	1-1/2"	SELF RIMMING, SINGLE COMPARTMENT SINK, 18 GAUGE, TYPE 304 S/S, 26"X22"X10-3/8" DEEP, PUNCHED FOR 3-HOLE FAUCET. PROVIDE DECK MOUNTED, RIGID/SWING GOOSENECK CHICAGO FAUCETS MODEL 796-GNAE3ABCP. PROVIDE 3/8" ANGLE SUPPLY, CAST BRASS P-TRAP W/ CLEANOUT, LOOSE KEY STOPS. INSTALL PER MANUFACTURERS INSTRUCTIONS.
S-2	SINK COUNTERTOP (DOUBLE BOWL)	ELKAY	DLR332210	1/2"	1/2"	2"	1-1/2"	SELF-RIMMING, DOUBLE COMPARTMENT SINK, TYPE 302, 18-8 S/S, 33"X22"X10-1/8" DEEP, PUNCHED FOR 3-HOLE FAUCET. PROVIDE DECK MOUNTED, SINGLE LEVER, AERATOR, DELTA MODEL 300LF-WF FAUCET. PROVIDE 3/8" ANGLE SUPPLY W/ VERTICAL TUBE, P-TRAP W/ CLEANOUT AND LOOSE KEY STOPS. INSTALL PER MANUFACTURERS INSTRUCTIONS.
SH-1	SHOWER VALVE	SYMMONS	C-96-500-830-V-X	1/2"	1/2"	3"	1-1/2"	SHOWER / HAND SHOWER SYSTEM, SINGLE HANDLE PRESSURE BALANCING MIXING VALVE WITH SHOWER HEAD AND HAND SHOWER WITH 30" SLIDE BAR AND 60" FLEXIBLE METAL HOSE. INSTALL USING MANUFACTURERS RECOMMENDED INSTALLATION INSTRUCTIONS.
HB-1	HOSE BIBB (EXTERIOR)	WOODFORD	867	3/4"	-	-	-	AUTOMATIC DRAINING, FREEZELESS WALL HYDRANT WITH HOSE CONNECTION BACKFLOW PROTECTION. ASSE 1024 APPROVED. TWO INDEPENDENT CHECK VALVES, BRASS VALVE BODY. LOOSE KEY. WALL BOX DOOR SHALL BE CHROME FINISH.
TMV-1	THERMOSTATIC MIXING VALVE	LAWLER	TMM-1070	-	-	-	-	POINT OF USE MIXING VALVE. HIGH TEMPERATURE LIMIT STOP WITH AUTOMATIC RESET. LEAD FREE BRONZE BODY CONSTRUCTION WITH INTEGRAL BACK FLOW CHECKS. MAX. OPERATING PRESSURE OF 125 PSI AND ASSE 1070 APPROVED. SET POINT TEMPERATURE OF 110°F. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
FD-1	FLOOR DRAIN	ZURN	ZN415-B	-	-	3"	2"	CAST IRON BODY WITH BOTTOM OUTLET, INVERTIBLE MEMBRANE CLAMP AND ADJUSTABLE COLLAR WITH 6" DIAMETER TYPE "B" NICKEL BRONZE ROUND STRAINER. PROVIDE WITH DEEP SEAL TRAP.
EW-1	HULO ELECTRIC WATER COOLER	ELKAY	EZSTL8C	1/2"	-	2"	1-1/2"	BARRIER FREE ADA COMPLIANT ELECTRIC WATER COOLER. COORDINATE POWER OUTLET LOCATION WITH ELECTRICAL CONTRACTOR FOR ELECTRICAL CORD WITH 3-PRONG PLUG. INSTALL PER MANUFACTURERS RECOMMENDATIONS. REFER TO ARCHITECTURAL ELEVATION VIEWS FOR MOUNTING HEIGHTS.
MS-1	MOP SINK	FIAT	MSB-2424	3/4"	3/4"	3"	1-1/2"	FLOOR MOUNTED MOLDED PLASTIC BASIN WITH HOSE BRACKET 832-AA, WALL MOUNTED FAUCET 830-AA AND CORNER GUARD ON THE FRONT LIP.
IMB-1	ICE MAKER CONNECTION BOX	OATEY	39156	1/2"	-	-	-	ICE MAKER OUTLET BOX, RECESSED UNIT W/ ONE 1/2" VALVE (TOP SUPPLY) COLD WATER. PROVIDE OMNIPURE MODEL K2333 IN-LINE WATER FILTER MOUNTED BELOW SINK CABINET.
WCO	WALL CLEANOUT	ZURN	Z1446	-	-	-	-	WALL CLEANOUT WITH STAINLESS STEEL ROUND ACCESS COVER. SEE PLANS FOR PIPE SIZE CONNECTION.
FCO	FLOOR CLEANOUT	ZURN	Z1400	-	-	-	-	FLOOR CLEANOUT WITH ACCESS COVER. SEE PLANS FOR PIPE SIZE CONNECTION.
ECO	EXTERIOR CLEANOUT	ZURN	Z-1400-HD	-	-	-	-	HEAVY TRAFFIC AREA EXTERIOR CLEANOUT WITH ACCESS COVER AND TWO-WAY FITTING. SEE PLANS FOR PIPE SIZE CONNECTION.
WHA	WATER HAMMER ARRESTOR	ZURN / WILKINS	1250	-	-	-	-	WATER HAMMER ARRESTOR SHALL MEET ASSE 1010. THE DEVICE SHALL CONSIST OF A COPPER BODY WITH AN ACETAL PISTON, BUNA NITRILE O-RINGS AND LEAD FREE SOLDER. THE DEVICE SHALL BE PRE-CHARGED AND SEALED AT THE FACTORY.
TG-1	TRAP GUARD	PROVENT	PROSET	-	-	-	-	ELASTOMERIC, NORMALLY CLOSED TRAP GUARD DEVICE.
BFP-1	BACKFLOW PREVENTER	WATTS	LF7C	-	-	-	-	DUAL CHECK VALVE BACKFLOW PREVENTER, ASSE 1024 APPROVED, WITH CAST BODY. CAN BE INSTALLED VERTICALLY OR HORIZONTALLY.
RD-1	PRIMARY ROOF DRAIN	ZURN	ZC-100	-	-	-	-	MAIN ROOF DRAIN, 15" DIAMETER, DURA-COATED CAST IRON BODY WITH COMBINATION MEMBRANE FLASHING CLAMP/GRAVEL GUARD WITH CAST IRON DOME. SEE PLANS FOR PIPE SIZE CONNECTIONS.
SP-1	SUMP PUMP	ZOELLER	940-0006	-	-	-	-	ZOELLER "OIL SMART SYSTEM" SUMP PUMP PACKAGE. CAST IRON CONSTRUCTION WITH POWDER COATED EPOXY FINISH AND ALL STAINLESS STEEL FITTINGS. N152 PUMP WITH NON-CLOGGING THERMOPLASTIC VORTEX IMPELLER, 115V (1Ø), 4/10 HP, 8.5 AMPS. INCLUDES SWITCH AND ALARMS TO INDICATE HIGH WATER LEVEL OR OIL DETECTED CONDITIONS. PUMP MODEL 152 PASSES 3/4" SPHERICAL SOLIDS. SUMP PUMP TO SHUT-DOWN AND GO INTO ALARM UPON DETECTION OF OIL IN ELEVATOR PIT. SUMP PUMP SYSTEM SHALL BE INSTALLED PER 2017 FLORIDA BUILDING CODE - SECTIONS 301.6 AND 1003.4.2.
NOTE: 1. VERIFY WITH OWNER ALL SPECIFIED EQUIPMENT SELECTIONS PRIOR TO PURCHASE AND INSTALLATION. 2. REFER TO ARCHITECTURAL DRAWINGS FOR ALL FINAL LOCATIONS AND MOUNTING DIMENSIONS OF ALL PLUMBING FIXTURES. PROVIDE ADA CONFORMING FACTORY INSULATION KIT ON HOT, COLD AND P-TRAP WASTE PIPING AT HANDICAP DESIGNATED LAVATORIES.								

FIXTURE SPECIFICATIONS - ADD ALTERNATE #4								
TAG	FIXTURE	MANUFACTURER	MODEL #	PIPE SIZE				DESCRIPTION
				CW	HW	SAN	VENT	
WC-1	WATER CLOSET FLUSH VALVE	AMERICAN STANDARD	3461.528	1"	-	4"	2"	ADA COMPLIANT, VITREOUS CHINA, FLOOR MOUNTED, 1.28 GPF, ELONGATED BOWL WATER CLOSET AND SELECTRONIC AUTOMATIC FLUSH VALVE WITH FACTORY-INSTALLED CR-P2 LITHIUM BATTERY. PROVIDE WITH MANUFACTURERS RECOMMENDED ANGLE SUPPLY STOPS, SUPPLY TUBING AND INSTALLATION MATERIALS. PROVIDE ANTIMICROBIAL OPEN FRONT COVERLESS SEAT.
WC-2	WATER CLOSET FLUSH VALVE	AMERICAN STANDARD	2234.528	1"	-	4"	2"	VITREOUS CHINA, FLOOR MOUNTED, 1.28 GPF, ELONGATED BOWL WATER CLOSET AND SELECTRONIC AUTOMATIC FLUSH VALVE WITH FACTORY-INSTALLED CR-P2 LITHIUM BATTERY. PROVIDE WITH MANUFACTURERS RECOMMENDED ANGLE SUPPLY STOPS, SUPPLY TUBING AND INSTALLATION MATERIALS. PROVIDE ANTIMICROBIAL OPEN FRONT COVERLESS SEAT.
UR-1	URINAL	AMERICAN STANDARD	6590.505	3/4"	-	2"	1-1/2"	ADA COMPLIANT WALL HUNG VITREOUS CHINA URINAL, 0.5 GPF, 3/4" INLET TOP SPUD, FLUSHING RIM. PROVIDE WITH SELECTRONIC URINAL AUTOMATIC FLUSH VALVE, FACTORY-INSTALLED CR-P2 LITHIUM BATTERY, WALL MOUNTING HARDWARE, ANGLE SUPPLY STOPS, SUPPLY TUBING AND INSTALLATION MATERIALS. REFER TO ARCHITECTURAL DRAWINGS FOR ADA MOUNTING HEIGHT.
UR-2	URINAL	AMERICAN STANDARD	6590.505	3/4"	-	2"	1-1/2"	WALL HUNG VITREOUS CHINA URINAL, 0.5 GPF, 3/4" INLET TOP SPUD, FLUSHING RIM. PROVIDE WITH SELECTRONIC URINAL AUTOMATIC FLUSH VALVE, FACTORY-INSTALLED CR-P2 LITHIUM BATTERY, WALL MOUNTING HARDWARE, ANGLE SUPPLY STOPS, SUPPLY TUBING AND INSTALLATION MATERIALS. REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHT.
NOTE: 1. VERIFY WITH OWNER ALL SPECIFIED EQUIPMENT SELECTIONS PRIOR TO PURCHASE AND INSTALLATION. 2. REFER TO ARCHITECTURAL DRAWINGS FOR ALL FINAL LOCATIONS AND MOUNTING DIMENSIONS OF ALL PLUMBING FIXTURES. PROVIDE ADA CONFORMING FACTORY INSULATION KIT ON HOT, COLD AND P-TRAP WASTE PIPING AT HANDICAP DESIGNATED LAVATORIES. 3. ENTIRE DOMESTIC COLD WATER SYSTEM TO BE UPSIZED PER THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING TO HANDLE ADDITIONAL WATER VOLUME FROM FLUSH VALVE FIXTURES.								

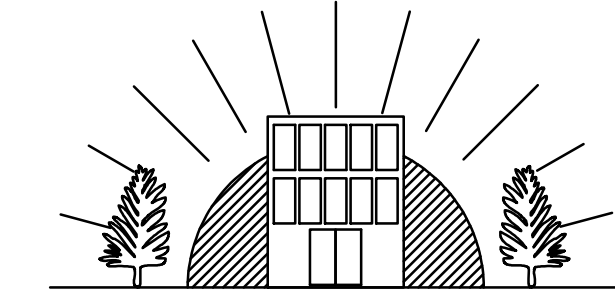
ELECTRIC WATER HEATER SCHEDULE											
MARK	AREA SERVED	STORAGE CAPACITY (GALLONS)	RECOVERY (GPH @60° RISE)	TOTAL WEIGHT (LBS)	TOTAL KW	VOLTS	PH	MANUFACTURER	MODEL	LOCATION	NOTES
EW-1	WEST ADDITION	40	41	460	6	480	3	A.O. SMITH	DEL-40	JAN 128A	1,2
EW-2	EAST ADDITION	80	68	880	10	480	3	A.O. SMITH	DEN-80	JAN CLOS 104	3
NOTES: 1. SIMULTANEOUS 3 KW ELEMENT OPERATION. 2. PROVIDE WALL MOUNT WATER HEATER SHELF ABOVE MOP SINK. 3. SIMULTANEOUS 5 KW ELEMENT OPERATION.											

PIPING MATERIAL SCHEDULE						
SERVICE	SIZE	MATERIAL	SCHEDULE/TYPE	INSULATION		REMARKS
				TYPE	THICKNESS	
COLD WATER	ALL	CPVC	SCH. 40	FG	1"	SEE NOTE 2
HOT WATER	ALL	CPVC	SCH. 40	FG	1"	SEE NOTE 2
SANITARY	ALL	C.I. OR PVC	NOTE 3	NONE	-	NO HUB
VENT	ALL	PVC	SCH. 40	NONE	-	SEE NOTE 1
ST BELOW GRADE	ALL	C.I. OR PVC	SERVICE WEIGHT	NONE	-	NO HUB
ST ABOVE GRADE	ALL	C.I. OR PVC	SERVICE WEIGHT	FG	1"	NO HUB
NOTES: 1. WASTE AND VENT PIPING IN PLENUM SPACE SHALL BE SERVICE WEIGHT CAST IRON, NO HUB. 2. FIBERGLASS PIPE INSULATION: MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. SEMIRIGID BOARD MATERIAL WITH FACTORY-APPLIED ASJ COMPLYING WITH ASTM C 1393, OR WITH PROPERTIES SIMILAR TO ASTM C 612. NOMINAL DENSITY IS 2.5 LB/CU. FT. OR MORE. THERMAL CONDUCTIVITY (K VALUE) AT 100 DEG. F (55 DEG. C) IS 0.29 BTU X IN./H X SQ. FT. X DEG. F (0.042 W/M X K) OR LESS. ALL SERVICE JACKET (ASJ): WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING WITH ASTM C 1136, TYPE. MANUFACTURER: A. CERTAINTED CORP., B. JOHNS MANVILLE, C. KNAUF INSULATION, D. OWENS CORNING 3. FOR PVC ONLY SCHEDULE 40 DWV. FOAM CORE PVC NOT ALLOWED. 4. POLYPROPYLENE (PP) PIPE SYSTEM BY AQUATHERM IS AN ACCEPTABLE BID ALTERNATE FOR THE DOMESTIC WATER SYSTEM.						

HOT WATER RECIRCULATION PUMP SCHEDULE												
MARK	FLOW (GPM)	HEAD (FT)	HP	VOLTS	HZ	PH	AMPS	RPM	MANUFACTURER	MODEL	LOCATION	NOTES
RCP-1	2	4	1/8	115	60	1	1.76	3250	TACO	0010-IFC	JAN 128A	1,2,3
RCP-2	3	9	1/8	115	60	1	1.76	3250	TACO	0010-IFC	JAN CLOS 104	1,2,3
NOTES: 1. PROVIDE BRONZE FLANGE CONNECTIONS AND BRONZE CASING. 2. PROVIDE AQUASTAT & TIMER FOR EACH PUMP OPERATION. AQUASTAT AND TIMER EACH REQUIRES A SEPERATE 115V-60-1 ELECTRICAL CONNECTION. 3. PROVIDE EACH PUMP WITH CIRCUIT SETTING BALANCING BALL VALVE. BELL & GOSSET CB CALIBRATED BALANCE VALVE. BRONZE BODY AND BRASS BALL CONSTRUCTION WITH GLASS AND CARBON FILLED TFE SEAT RINGS, BRASS READ OUT VALVES WITH EPT CHECK VALVES AND EPDM STEM O-RINGS. VALVE SHALL BE RATED FOR 200 PSI AND A WORKING TEMPERATURE OF 250°F.												



ARCHITECT:



DELOSE O'NEAL ENGINEERING

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CONSULTANTS:



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11651 Central Parkway, Suite 106 Jacksonville, FL 32224 (904) 992-0377 FL Cert of Auth: 28261 EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

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DESIGNED BY: KMO
REVIEWED BY: MNO

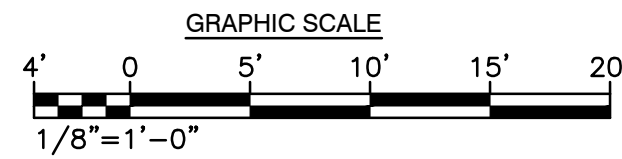
PROJECT TITLE AND ADDRESS
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THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
PLUMBING
SCHEDULES

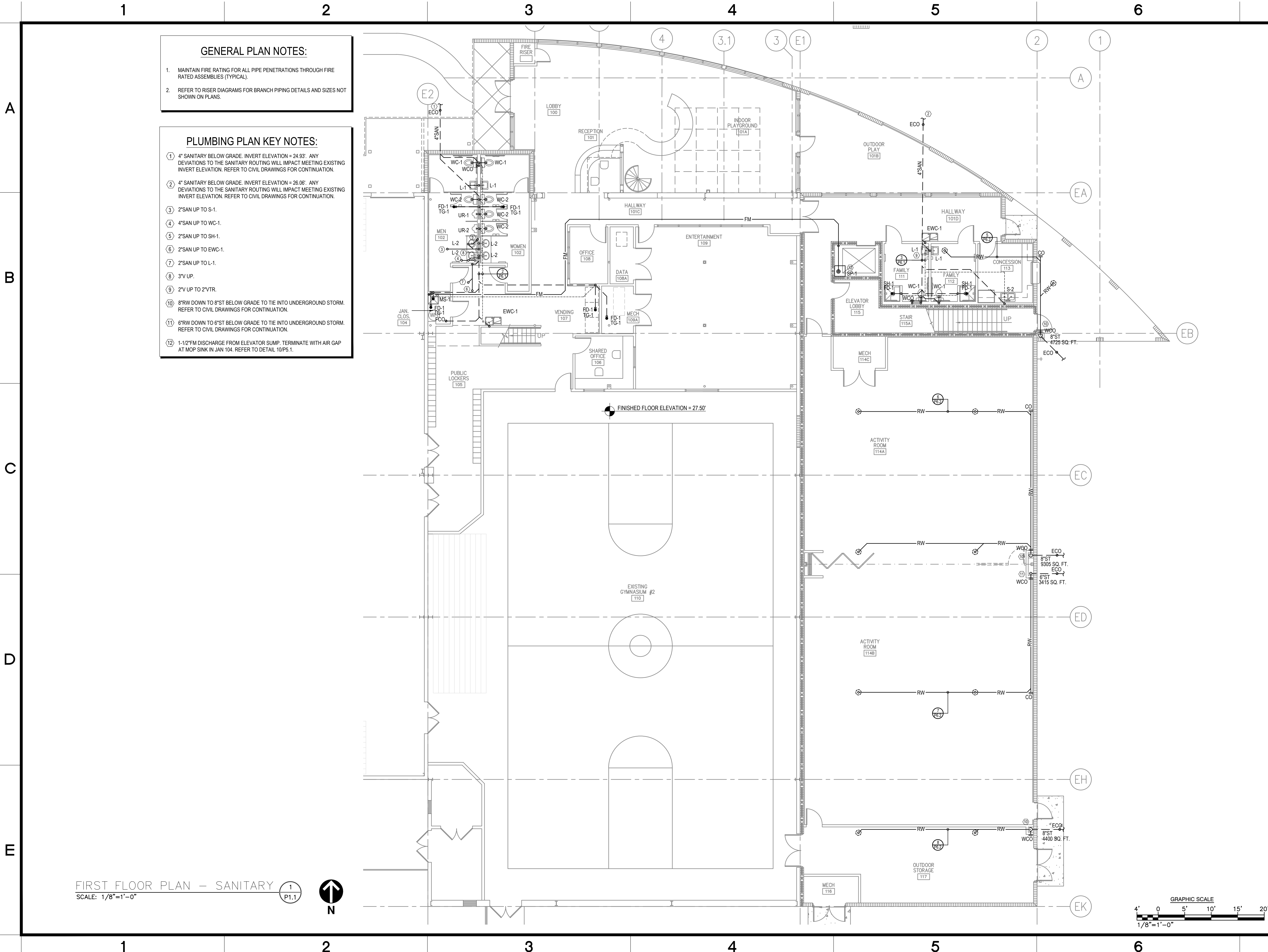
SHEET #
P.O.2

MINDY N. O'NEAL
FL# 69779

PROJECT # 020004 DATE:02.08.2020



MINDY N. O'NEAL FL# 69779	
PROJECT # 020004	DATE:02.08.2020



GENERAL PLAN NOTES:

1. MAINTAIN FIRE RATING FOR ALL PIPE PENETRATIONS THROUGH FIRE RATED ASSEMBLIES (TYPICAL).
2. REFER TO RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.

PLUMBING PLAN KEY NOTES:

- ① 4" SANITARY BELOW GRADE. INVERT ELEVATION = 24.93'. ANY DEVIATIONS TO THE SANITARY ROUTING WILL IMPACT MEETING EXISTING INVERT ELEVATION. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
- ② 4" SANITARY BELOW GRADE. INVERT ELEVATION = 26.06'. ANY DEVIATIONS TO THE SANITARY ROUTING WILL IMPACT MEETING EXISTING INVERT ELEVATION. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
- ③ 2" SAN UP TO S-1.
- ④ 4" SAN UP TO WC-1.
- ⑤ 2" SAN UP TO SH-1.
- ⑥ 2" SAN UP TO EWC-1.
- ⑦ 2" SAN UP TO L-1.
- ⑧ 3" V UP.
- ⑨ 2" V UP TO 2" VTR.
- ⑩ 8" RW DOWN TO 8" ST BELOW GRADE TO TIE INTO UNDERGROUND STORM. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
- ⑪ 6" RW DOWN TO 6" ST BELOW GRADE TO TIE INTO UNDERGROUND STORM. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
- ⑫ 1-1/2" FM DISCHARGE FROM ELEVATOR SUMP. TERMINATE WITH AIR GAP AT MOP SINK IN JAN 104. REFER TO DETAIL 10/P5.1.

FIRST FLOOR PLAN – SANITARY
SCALE: 1/8"=1'-0"
1 P1.1
N

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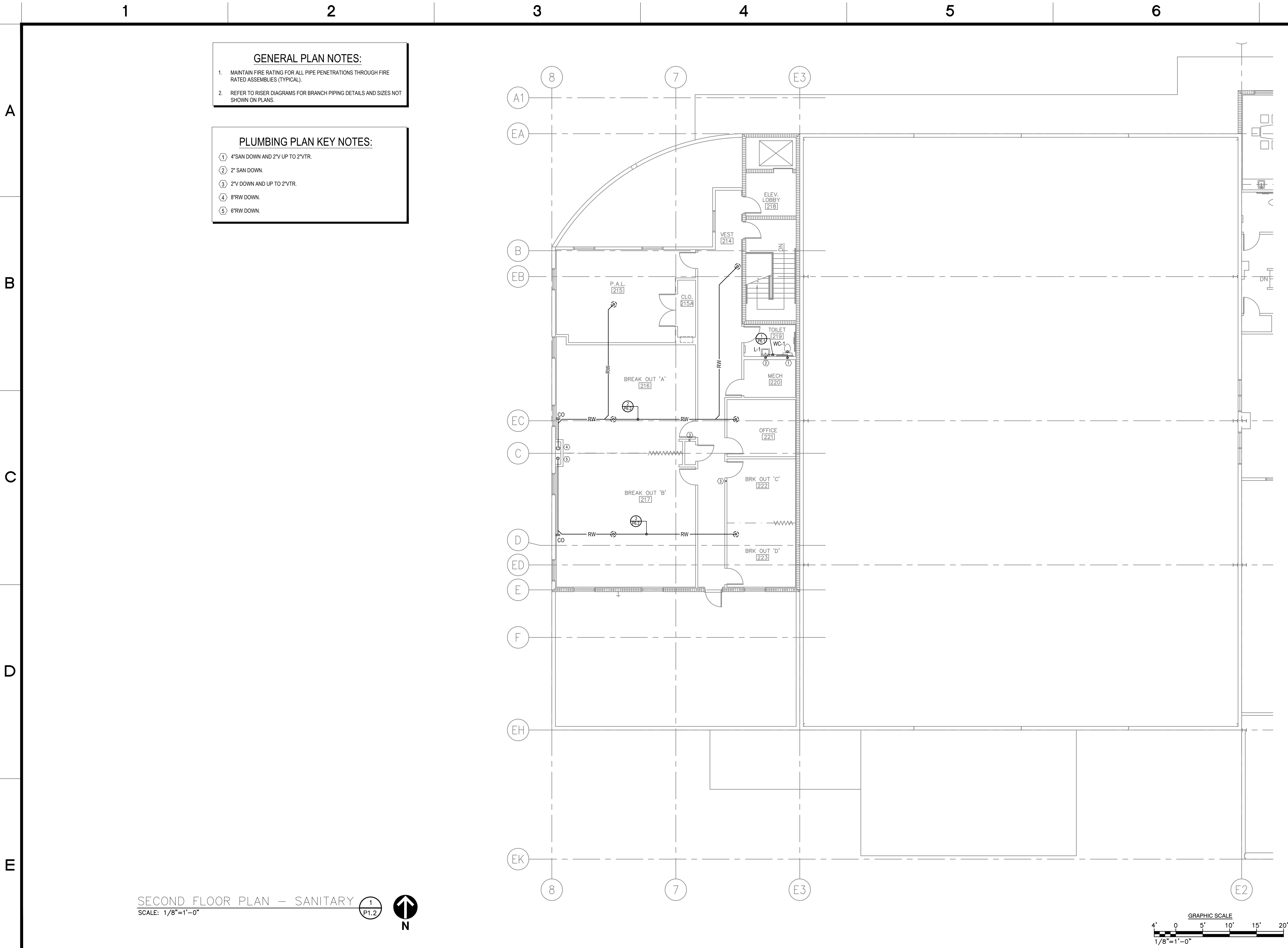
PROJECT TITLE AND ADDRESS
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CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**PARTIAL FIRST FLOOR
SANITARY PLAN**

MINDY N. O'NEAL
FL# 69779

SHEET #
P1.1

PROJECT # 020004
DATE: 02.08.2020



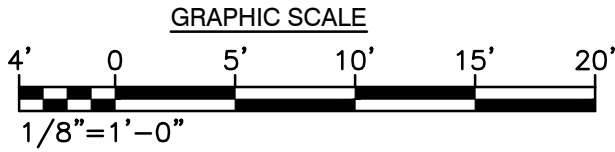
GENERAL PLAN NOTES:

1. MAINTAIN FIRE RATING FOR ALL PIPE PENETRATIONS THROUGH FIRE RATED ASSEMBLIES (TYPICAL).
2. REFER TO RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.

PLUMBING PLAN KEY NOTES:

- ① 4" SAN DOWN AND 2" V UP TO 2" VTR.
- ② 2" SAN DOWN.
- ③ 2" V DOWN AND UP TO 2" VTR.
- ④ 8" RW DOWN.
- ⑤ 6" RW DOWN.

SECOND FLOOR PLAN – SANITARY 1
SCALE: 1/8"=1'-0"



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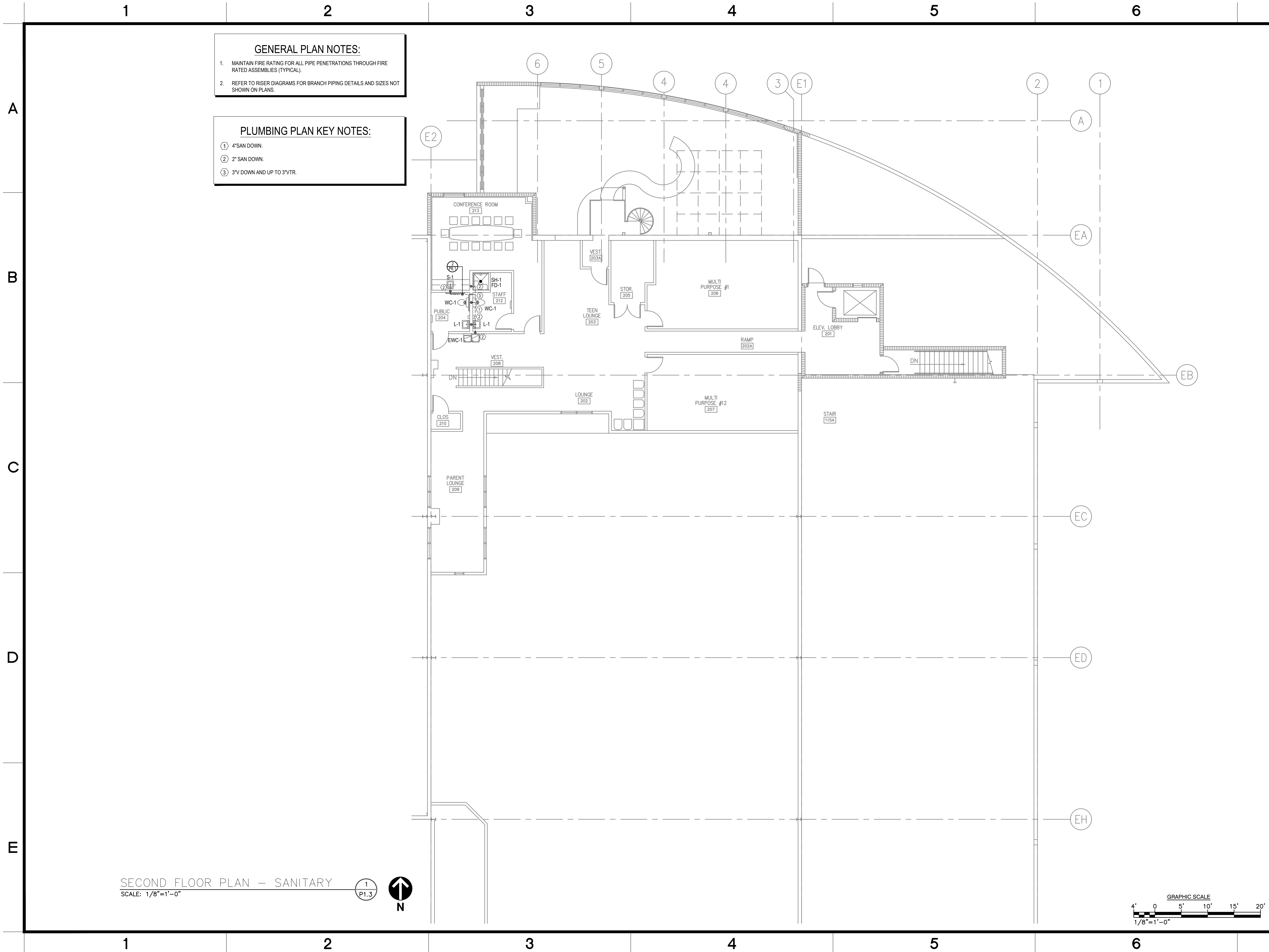
PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**PARTIAL SECOND FLOOR
SANITARY PLAN**

MINDY N. O'NEAL
FL # 69779

SHEET #
P1.2

PROJECT # 020004
DATE: 02.08.2020



- GENERAL PLAN NOTES:
1.

MAINTAIN FIRE RATING FOR ALL PIPE PENETRATIONS THROUGH FIRE RATED ASSEMBLIES (TYPICAL).
2.

REFER TO RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.

PLUMBING PLAN KEY NOTES:

①

4" SAN DOWN.

②

2" SAN DOWN.

③

3" V DOWN AND UP TO 3" VTR.

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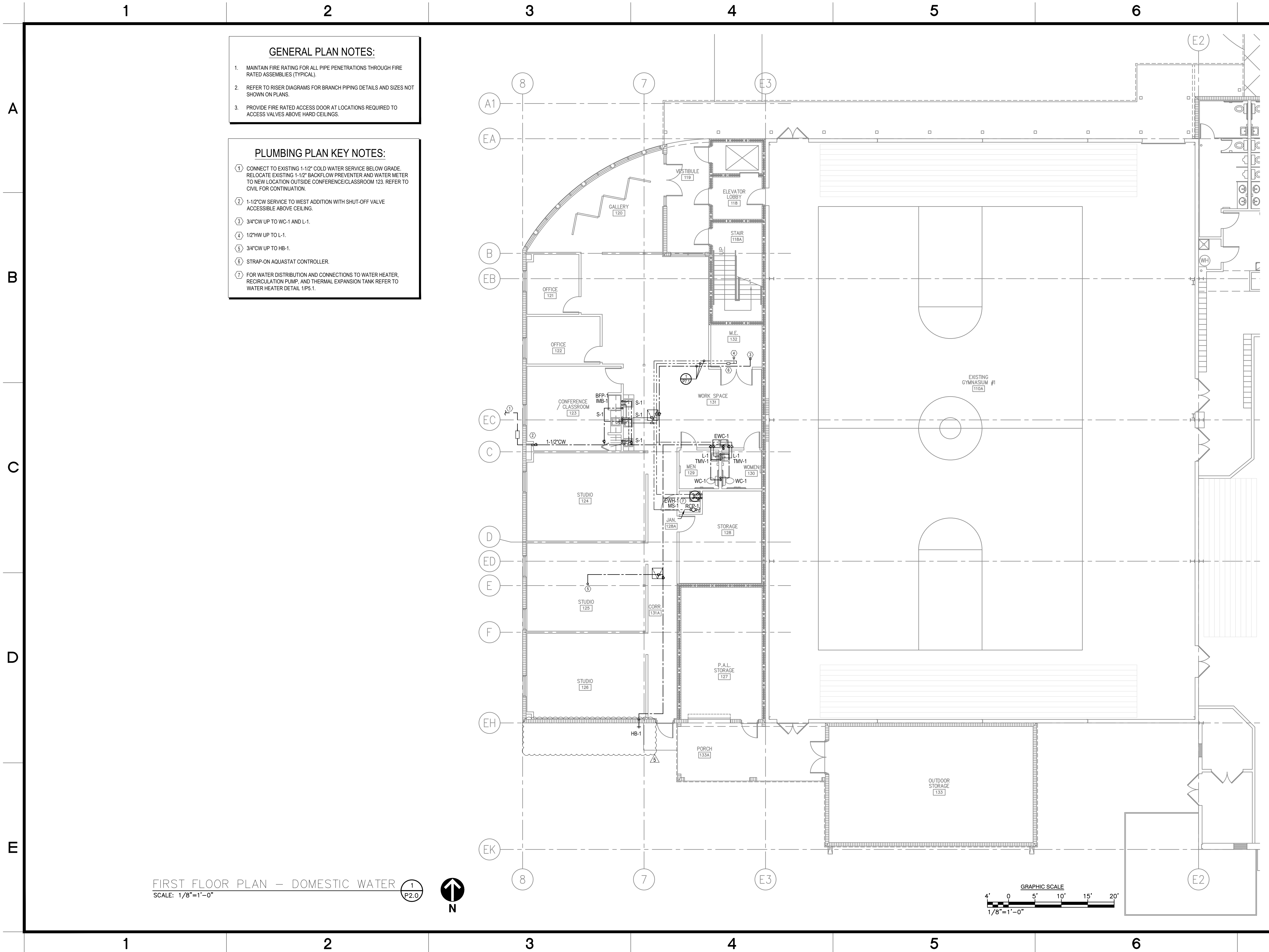
SHEET TITLE
PARTIAL SECOND FLOOR
SANITARY PLAN

MINDY NICOLE O'NEAL
LICENSE
No 69779
★
STATE OF FLORIDA
PROFESSIONAL ENGINEER

MINDY N. O'NEAL
FL# 69779

SHEET #
P1.3

PROJECT # 020004
DATE: 02.08.2020



- GENERAL PLAN NOTES:**
1. MAINTAIN FIRE RATING FOR ALL PIPE PENETRATIONS THROUGH FIRE RATED ASSEMBLIES (TYPICAL).
 2. REFER TO RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.
 3. PROVIDE FIRE RATED ACCESS DOOR AT LOCATIONS REQUIRED TO ACCESS VALVES ABOVE HARD CEILINGS.

- PLUMBING PLAN KEY NOTES:**
- ① CONNECT TO EXISTING 1-1/2" COLD WATER SERVICE BELOW GRADE. RELOCATE EXISTING 1-1/2" BACKFLOW PREVENTER AND WATER METER TO NEW LOCATION OUTSIDE CONFERENCE/CLASSROOM 123. REFER TO CIVIL FOR CONTINUATION.
 - ② 1-1/2"CW SERVICE TO WEST ADDITION WITH SHUT-OFF VALVE ACCESSIBLE ABOVE CEILING.
 - ③ 3/4"CW UP TO WC-1 AND L-1.
 - ④ 1/2"HW UP TO L-1.
 - ⑤ 3/4"CW UP TO HB-1.
 - ⑥ STRAP-ON AQUASTAT CONTROLLER.
 - ⑦ FOR WATER DISTRIBUTION AND CONNECTIONS TO WATER HEATER, RECIRCULATION PUMP, AND THERMAL EXPANSION TANK REFER TO WATER HEATER DETAIL 1/P.1.

FIRST FLOOR PLAN – DOMESTIC WATER

SCALE: 1/8"=1'-0"

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REVIEWED BY: MNO

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THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**PARTIAL FIRST FLOOR
DOMESTIC WATER PLAN**

MINDY NICOLE O'NEAL
LICENSE
No 69779
STATE OF FLORIDA
PROFESSIONAL ENGINEER

SHEET #
P 2.0

MINDY N. O'NEAL
FL# 69779

PROJECT # 020004 DATE:02.08.2020

GENERAL PLAN NOTES:

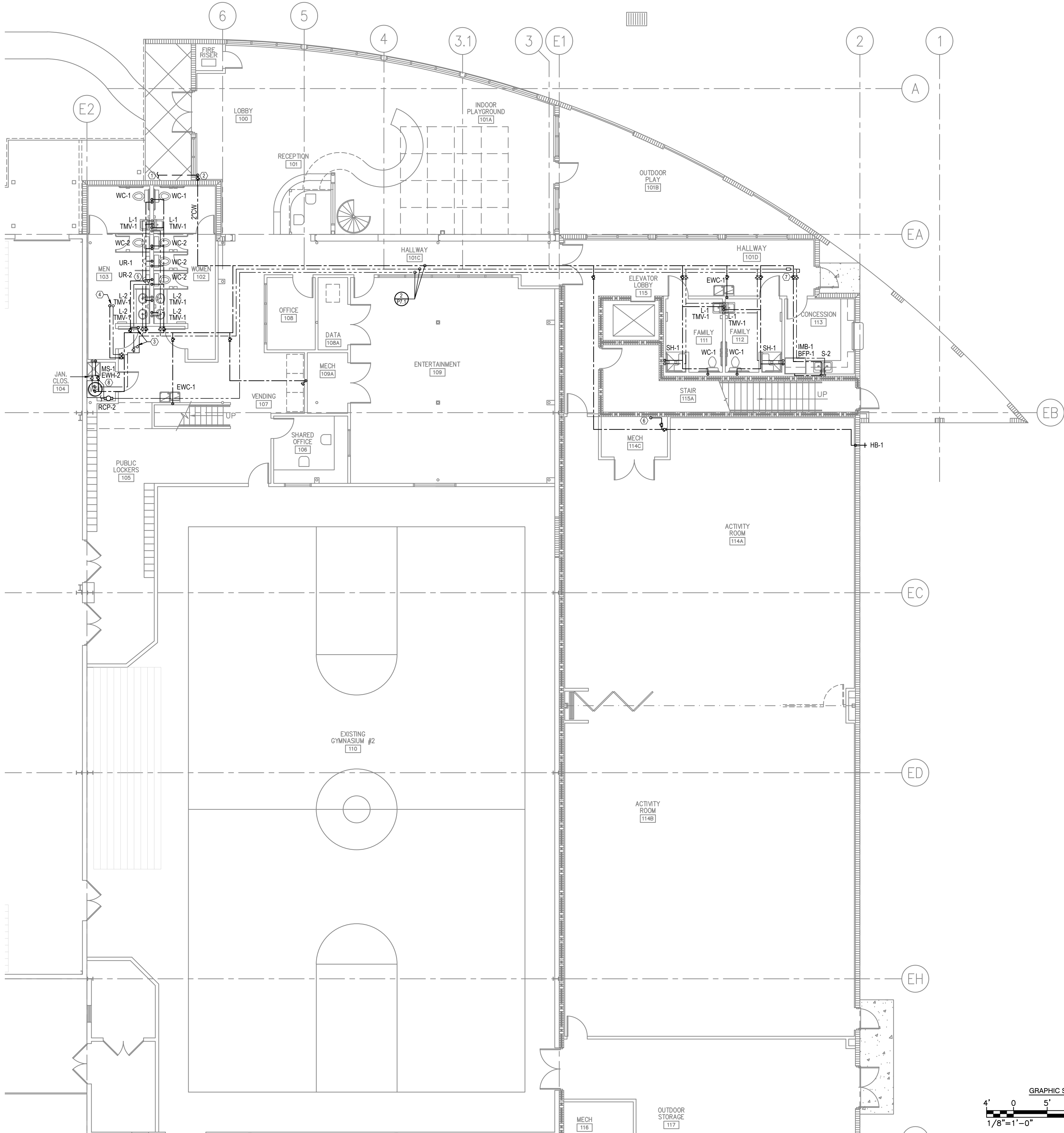
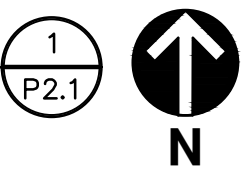
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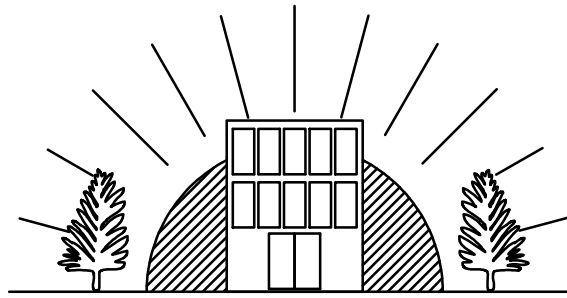
1. CONNECT TO EXISTING 2" COLD WATER SERVICE BELOW GRADE. EXISTING 2" BACKFLOW PREVENTER AND WATER METER TO REMAIN ON SITE. REFER TO FP1.0 AND CIVIL FOR CONTINUATION.
2. 2"CW SERVICE TO EAST ADDITION WITH SHUT-OFF VALVE ACCESSIBLE ABOVE CEILING.
3. 1/2"HW AND 1"CW UP TO (2) WC-1, (2) L-1, AND EWC-1.
4. 1/2"HW AND 1/2"CW UP TO S-1.
5. 1/2"HW AND 1/2"CW UP TO SH-1.
6. 3/4"CW UP TO HB-1.
7. STRAP-ON AQUASTAT CONTROLLER.
8. FOR WATER DISTRIBUTION AND CONNECTIONS TO WATER HEATER, RECIRCULATION PUMP, AND THERMAL EXPANSION TANK REFER TO WATER HEATER DETAIL 4/PS.1.

FIRST FLOOR PLAN — DOMESTIC WATER

SCALE: 1/8"=1'-0"



ARCHITECT:

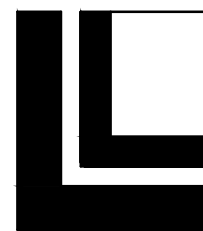


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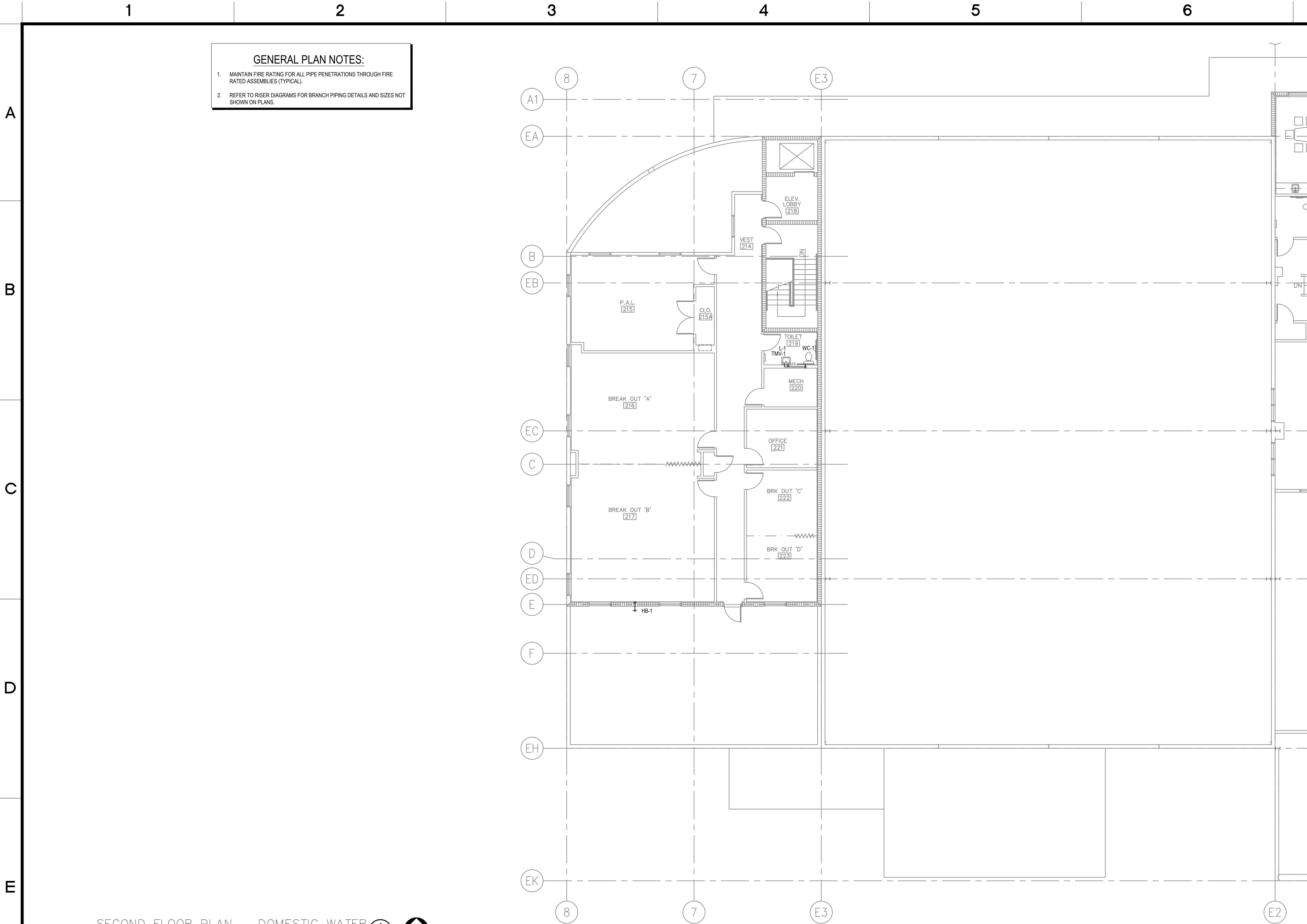
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PARTIAL FIRST FLOOR
DOMESTIC WATER PLAN



MINDY N. O'NEAL
FL# 69779

PROJECT # 020004 DATE: 02.08.2020

SHEET #
P2.1



- GENERAL PLAN NOTES:**
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 2. REFER TO RISER DIAGRAMS FOR BRANCH PIPING DETAILS AND SIZES NOT SHOWN ON PLANS.

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4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

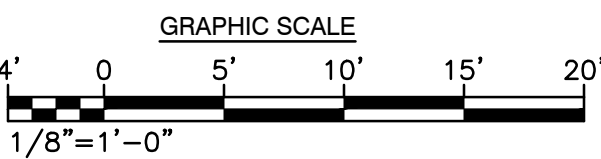
SHEET TITLE
**PARTIAL SECOND FLOOR
DOMESTIC WATER PLAN**

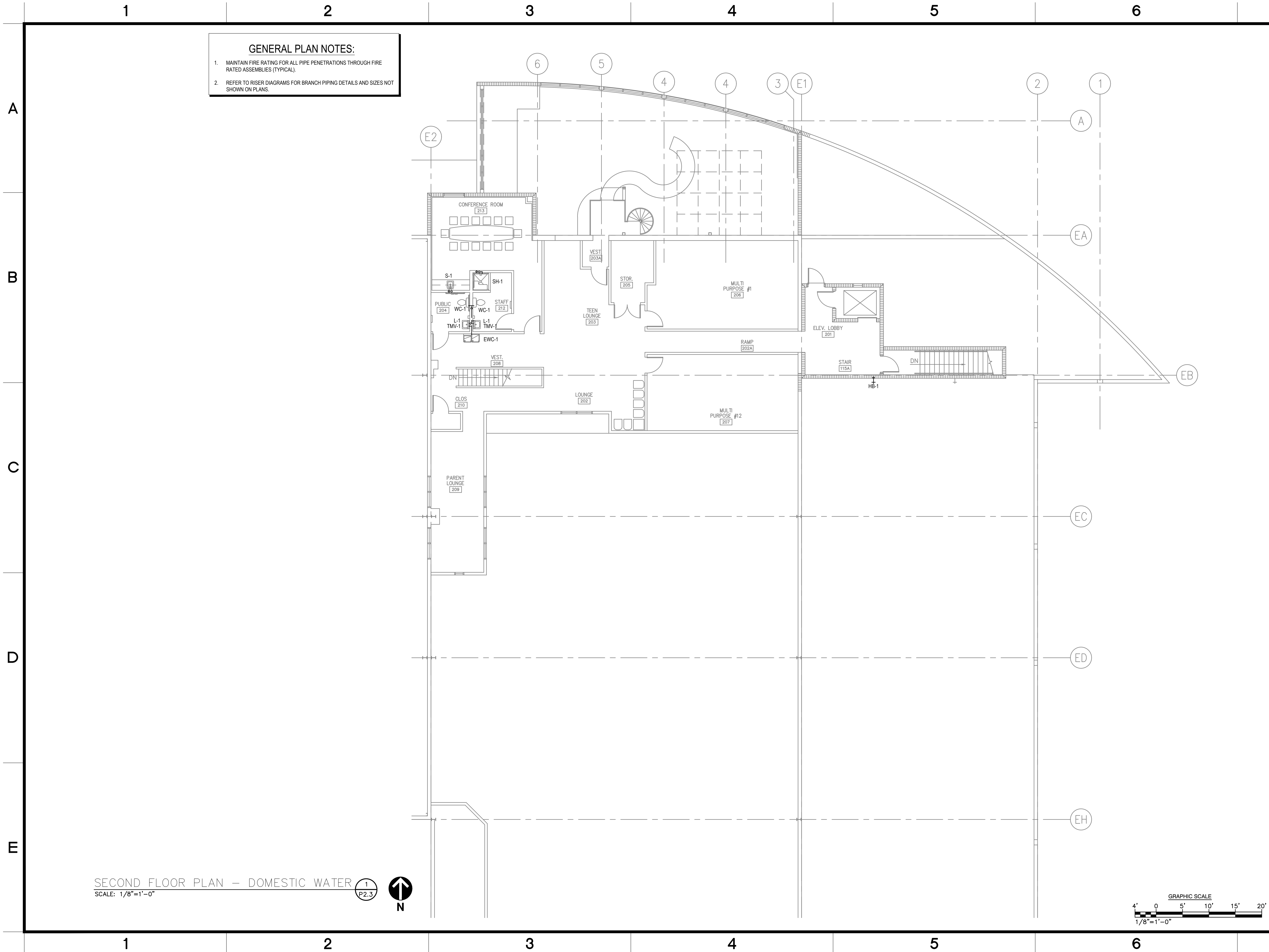
MINDY NICOLE O'NEAL
LICENSE
No 69779
★
STATE OF FLORIDA
PROFESSIONAL ENGINEER
MINDY N. O'NEAL
FL# 69779

SHEET #
P 2.2

PROJECT # 020004 DATE:02.08.2020

SECOND FLOOR PLAN - DOMESTIC WATER
SCALE: 1/8"=1'-0"

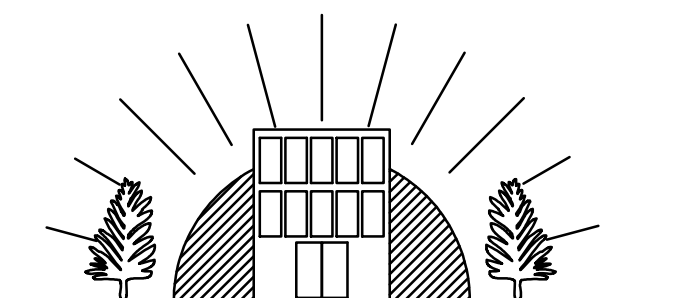




dj DESIGN, INC.

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AA 26000567
PHONE (386) 255-6987
FAX (386) 255-6989

ARCHITECT:



DELOOSE O'NEAL ENGINEERING

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CONSULTANTS:



LOWE STRUCTURES, INC.

11651 Central Parkway, Suite 106
Jacksonville, FL 32224
(904) 992-0377
FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

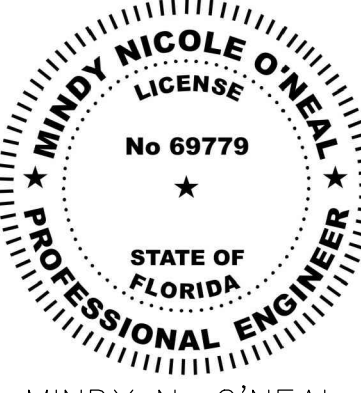
CONSULTANTS:

REV #	ISSUES / REVISIONS	DATE
1	SCHEMATIC DESIGN	2.28.2020
2	DESIGN DEVELOPMENT	4.06.2020
3	FINAL CONSTRUCTION DOCUMENTS	6.08.2020
4	PERMIT SET	11.06.2020
5	REVISED PERMIT SET	3.05.2021

DRAWN BY: KMO
DESIGNED BY: KMO
REVIEWED BY: MNO

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

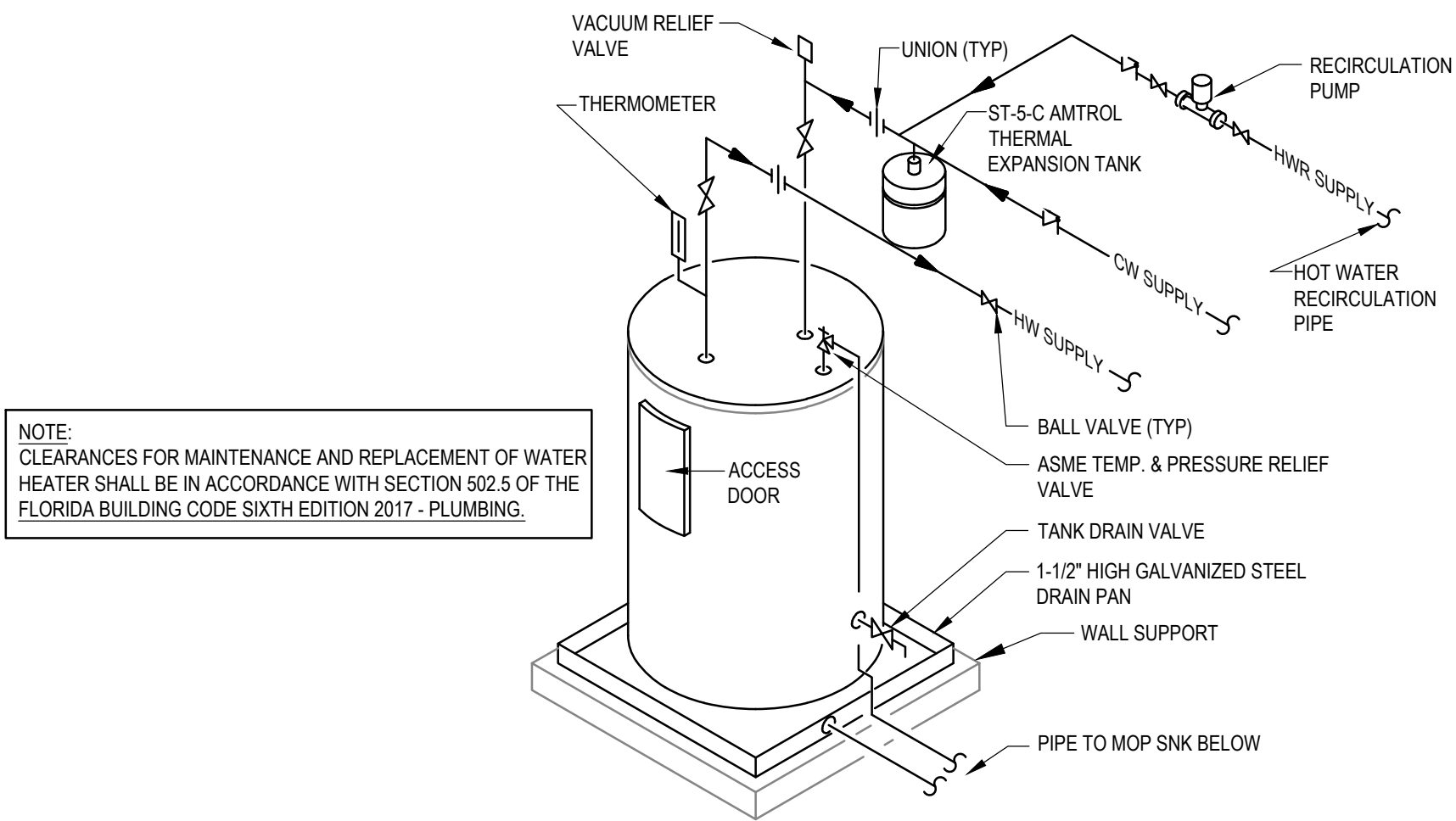
SHEET TITLE
PARTIAL SECOND FLOOR
DOMESTIC WATER PLAN



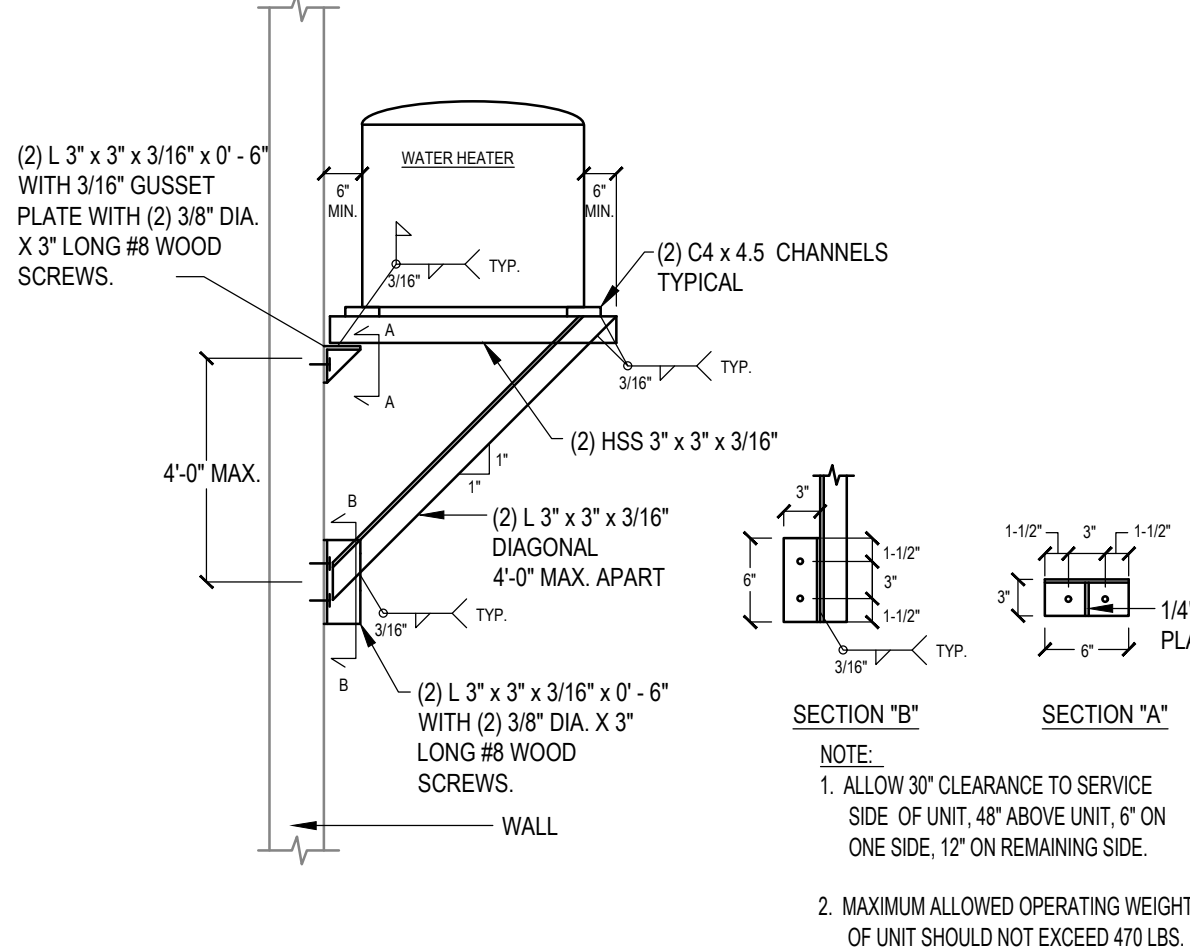
MINDY N. O'NEAL
FL# 69779

PROJECT # 020004 DATE: 02.08.2020

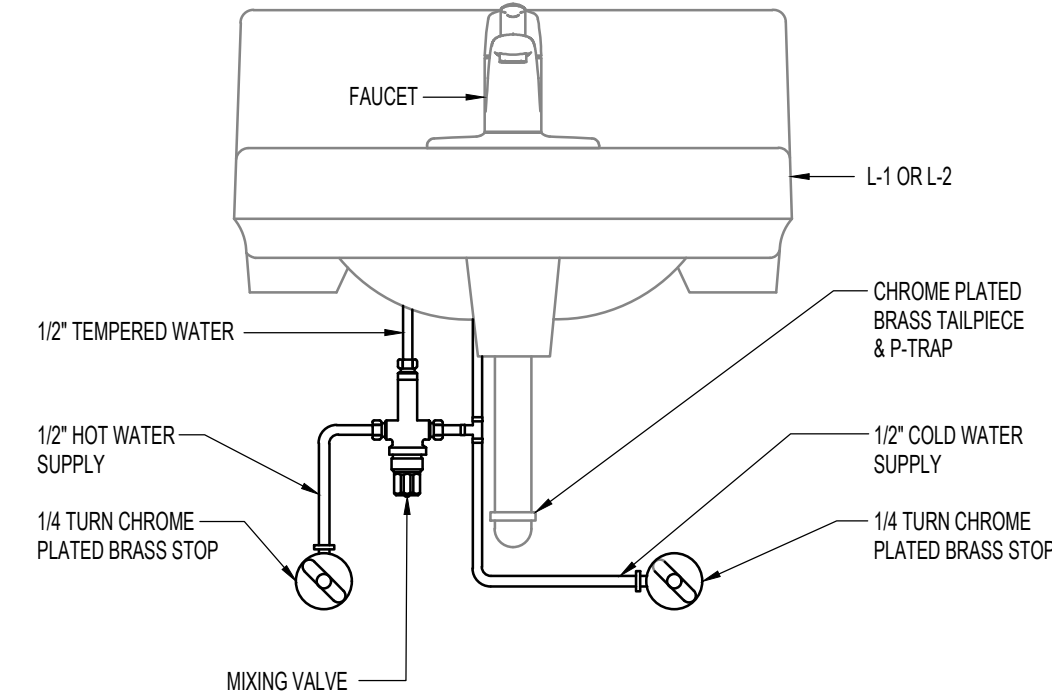
SHEET #
P 2.3



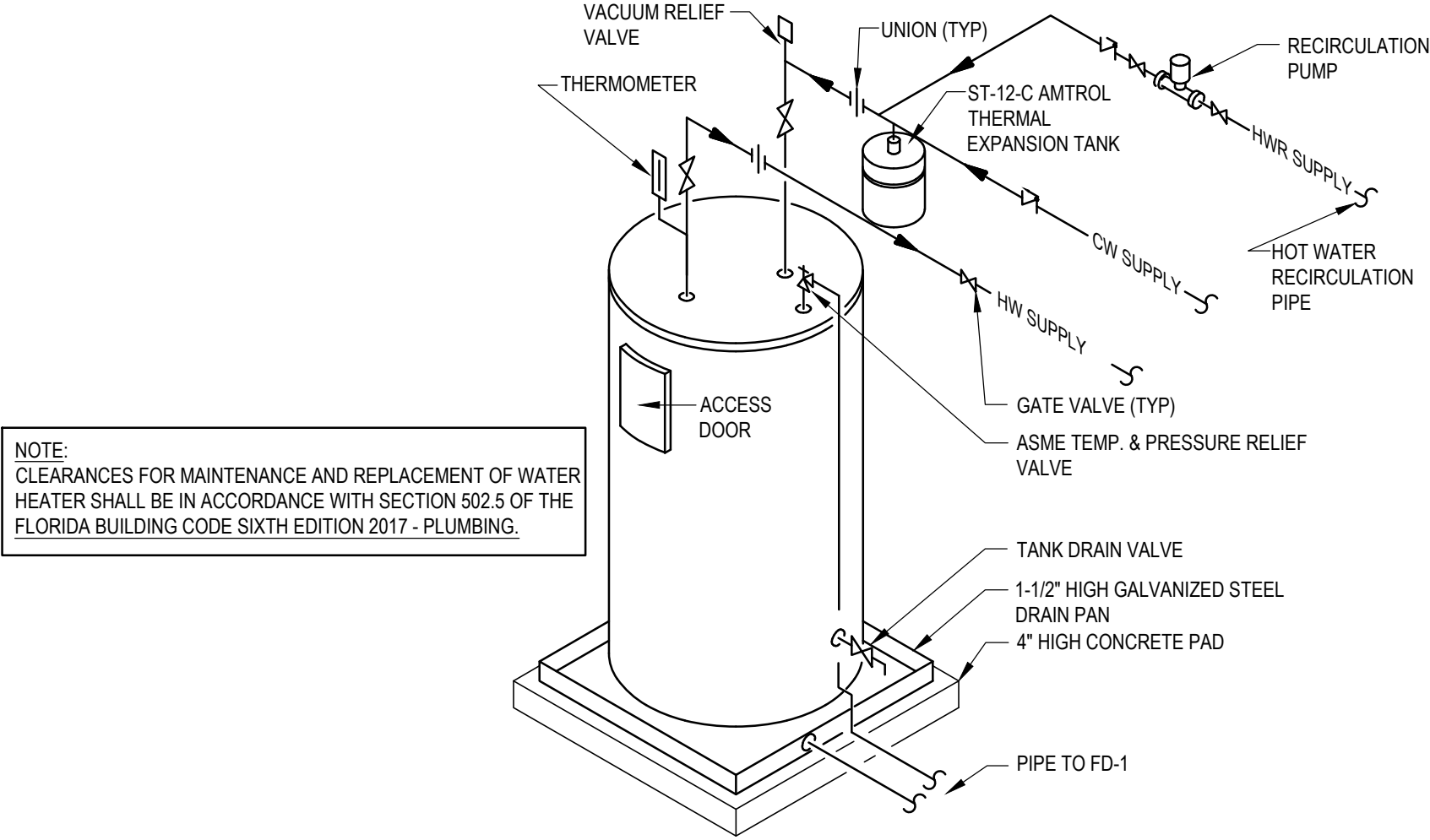
1 Water Heater Above Mop Sink Detail
SCALE: NOT TO SCALE



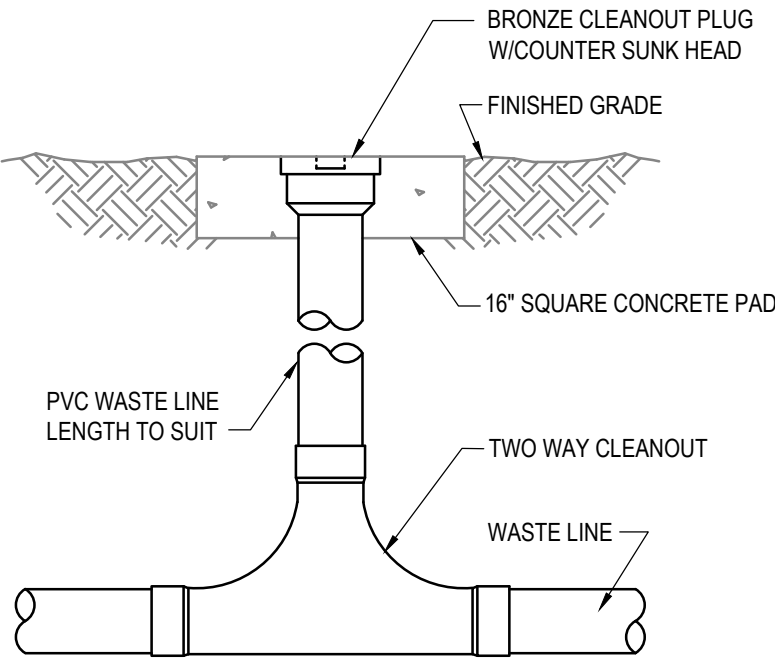
2 Water Heater Wall Support Detail
SCALE: NOT TO SCALE



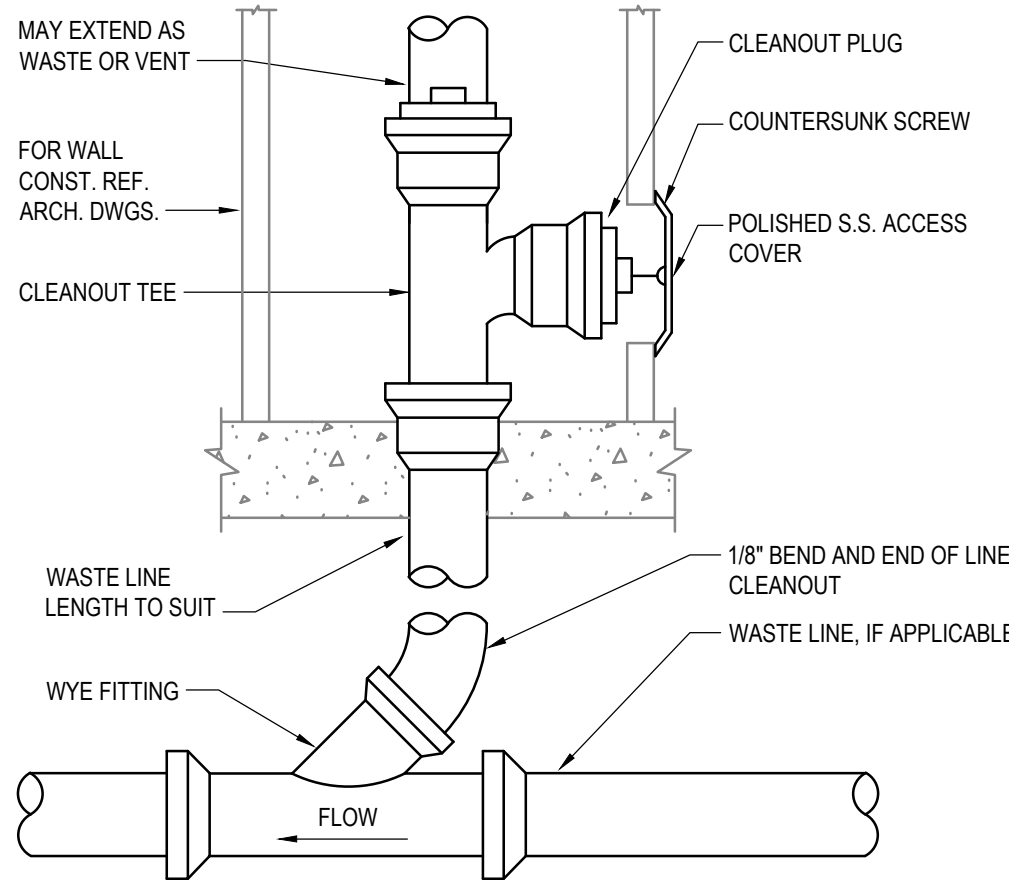
3 Tempering Valve Under Lav Detail
SCALE: NOT TO SCALE



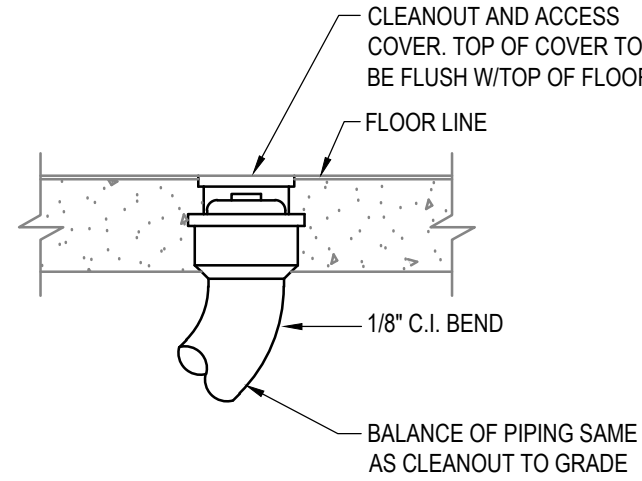
4 Water Heater Detail
SCALE: NOT TO SCALE



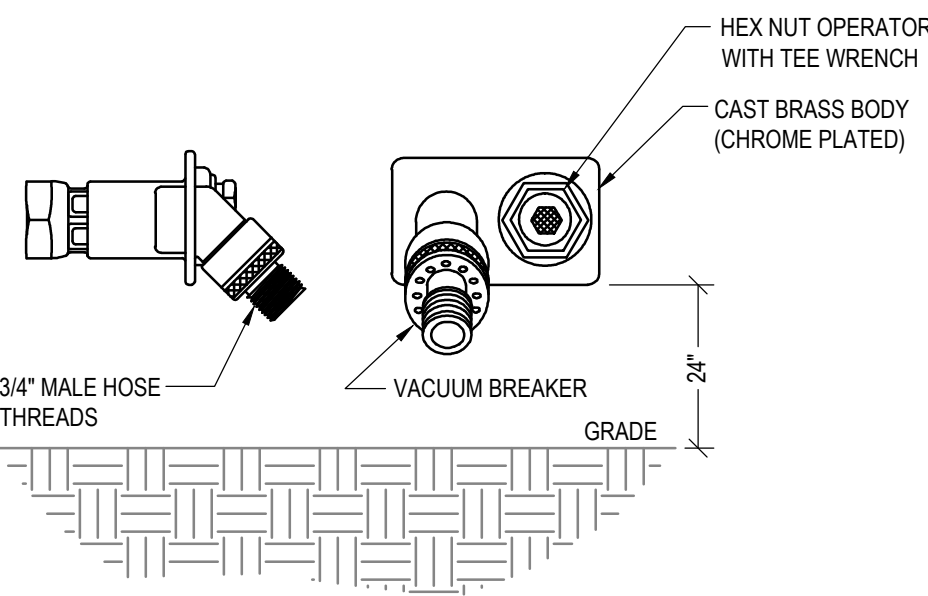
5 External Cleanout Detail
SCALE: NOT TO SCALE



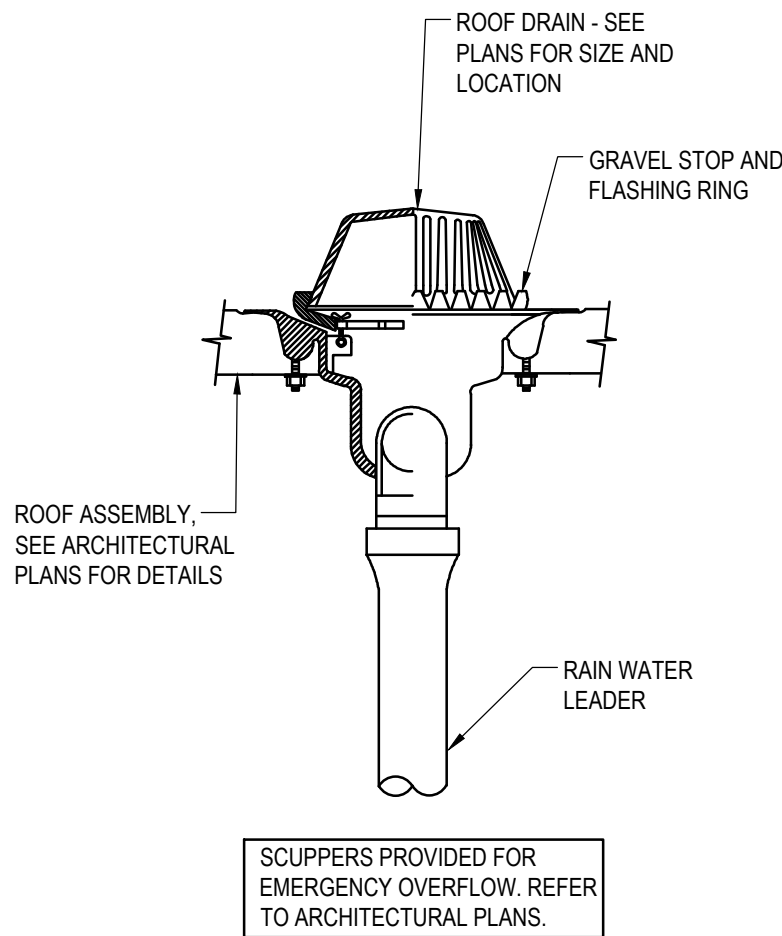
6 Wall Cleanout Detail
SCALE: NOT TO SCALE



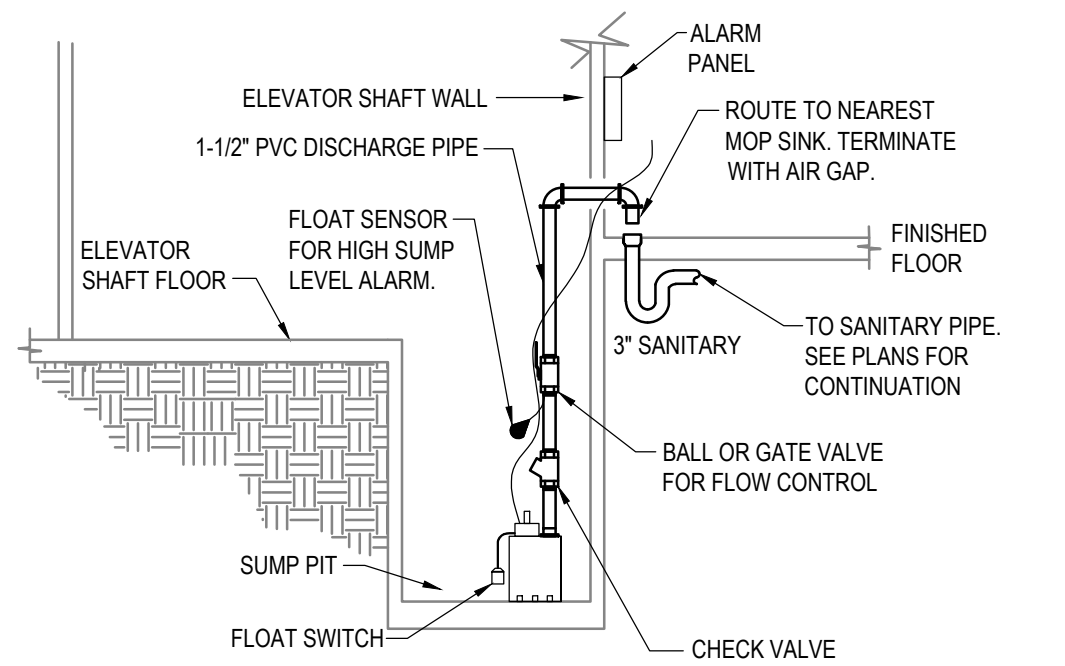
7 Floor Cleanout Detail
SCALE: NOT TO SCALE



8 Hose Bibb Detail
SCALE: NOT TO SCALE



9 Roof Drain Detail
SCALE: NOT TO SCALE

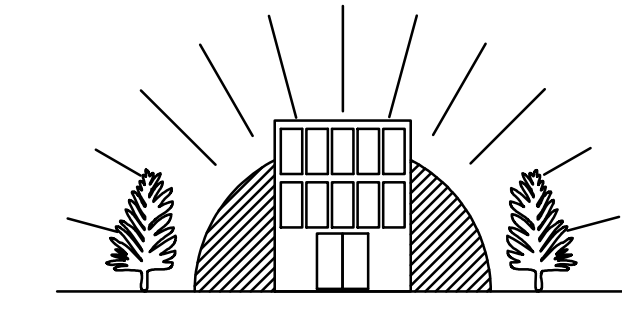


10 Elevator Sump Pump Detail
SCALE: NOT TO SCALE

- NOTES:
1. ALL ITEMS SHIPPED LOOSE FOR PIPING AND WIRING BY CONTRACTOR.
 2. ALL PIPING, VALVES, FIELD WIRING, ETC TO BE PROVIDED BY CONTRACTOR.
 3. PROVIDE CHECK VALVE.
 4. HIGH LEVEL FLOAT SENSOR AND CONDUCTIVITY PROBE WIRING TO BE TETHERED TO DISCHARGE PIPING BY CONTRACTOR.
 5. INSTALLATION TO BE IN ACCORDANCE WITH N.E.C. AND LOCAL CODES.

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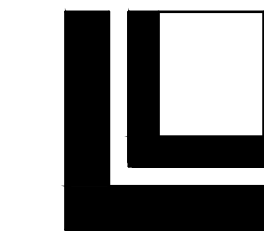
ARCHITECT:



DELOE O'NEAL ENGINEERING

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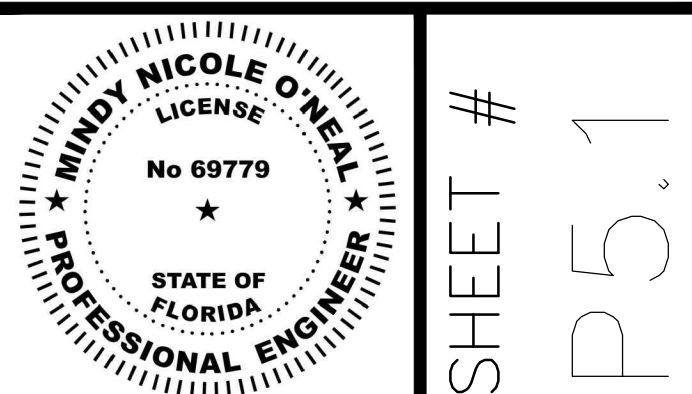
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REVIEWED BY: MNO

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4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

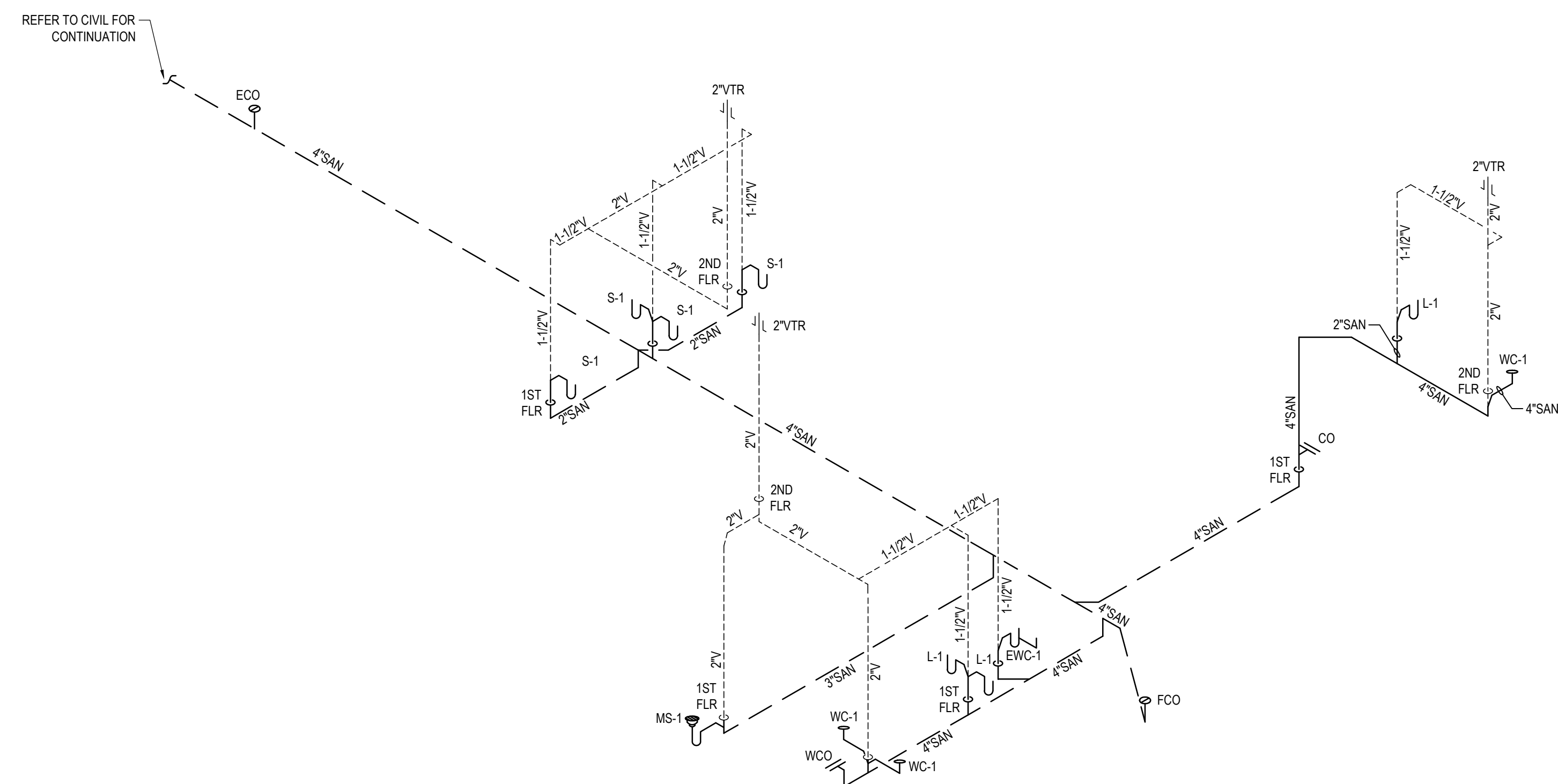
SHEET TITLE
**PLUMBING
DETAILS**



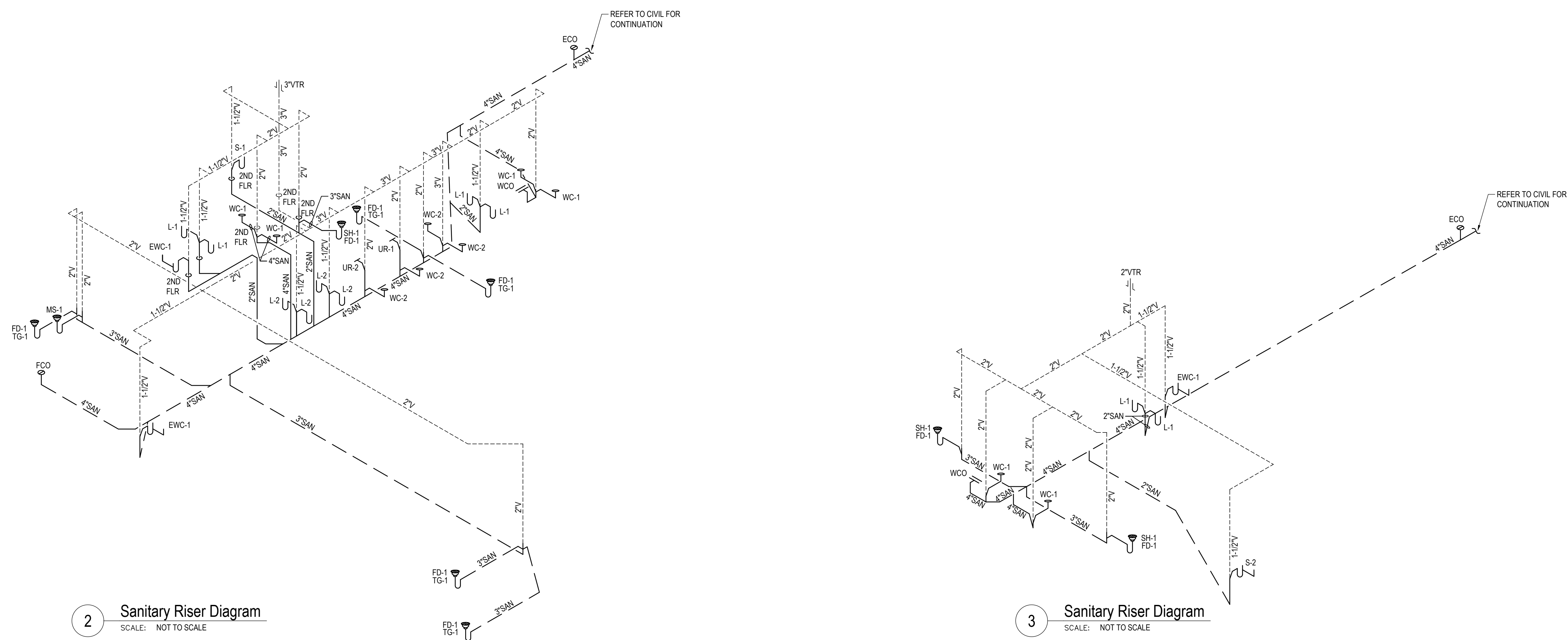
MINDY N. O'NEAL
FL# 69779

PROJECT # 020004 DATE: 02.08.2020

SHEET #
P5.1



1 Sanitary Riser Diagram
SCALE: NOT TO SCALE



2 Sanitary Riser Diagram

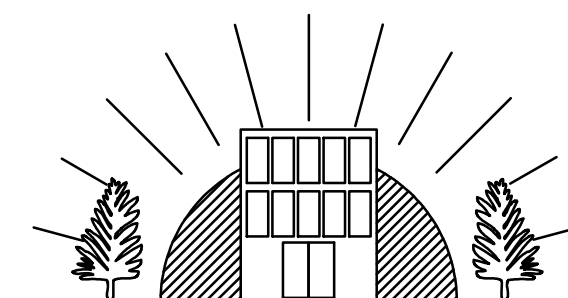
3 Sanitary Riser Diagram

GENERAL NOTES:

1. CLEANOUTS SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 708 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING.



ARCHITECT:

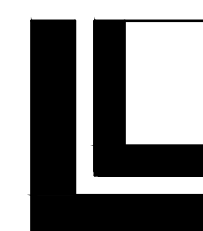


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C [321] 277-4128

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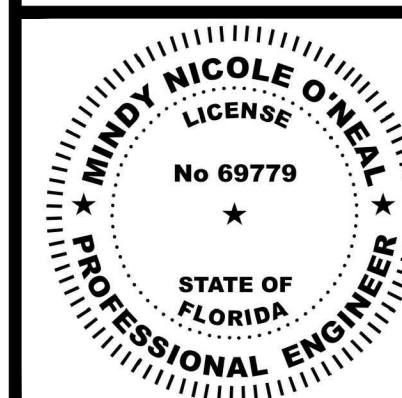
11651 Central Parkway, Suite 106
Jacksonville, FL 32224
(904) 992-0377
FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE:

[illegible]

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DESIGNED BY: KMO
REVIEWED BY: MNO

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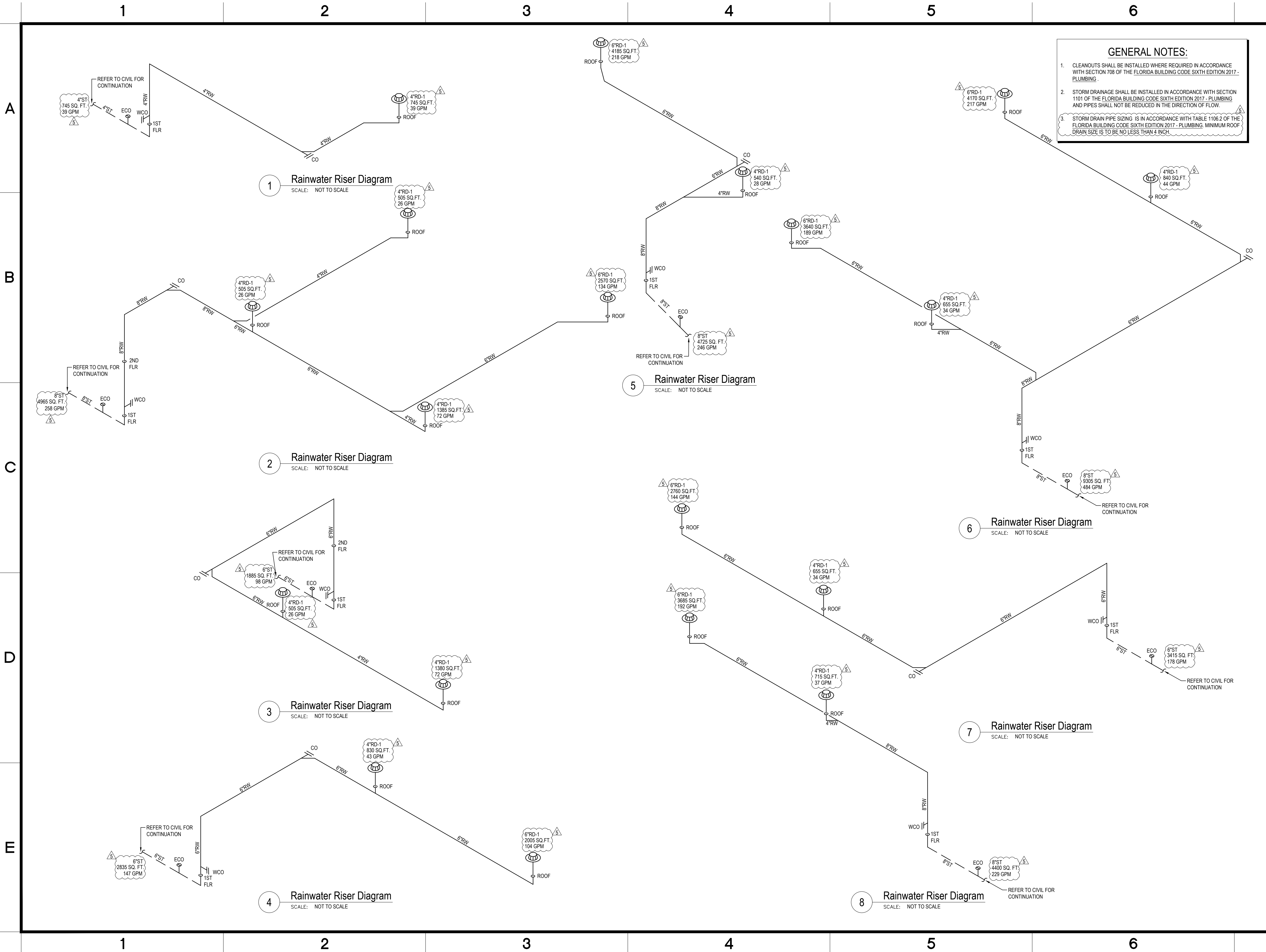
SHEET TITLE
SANITARY
RISER DIAGRAMS



MINDY N. O'NEAL
FL# 69779

16 SHEET #

PROJECT #	020004	DATE:02.08.2020
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EOR: J. Matthew Lowe FL PE: 59027

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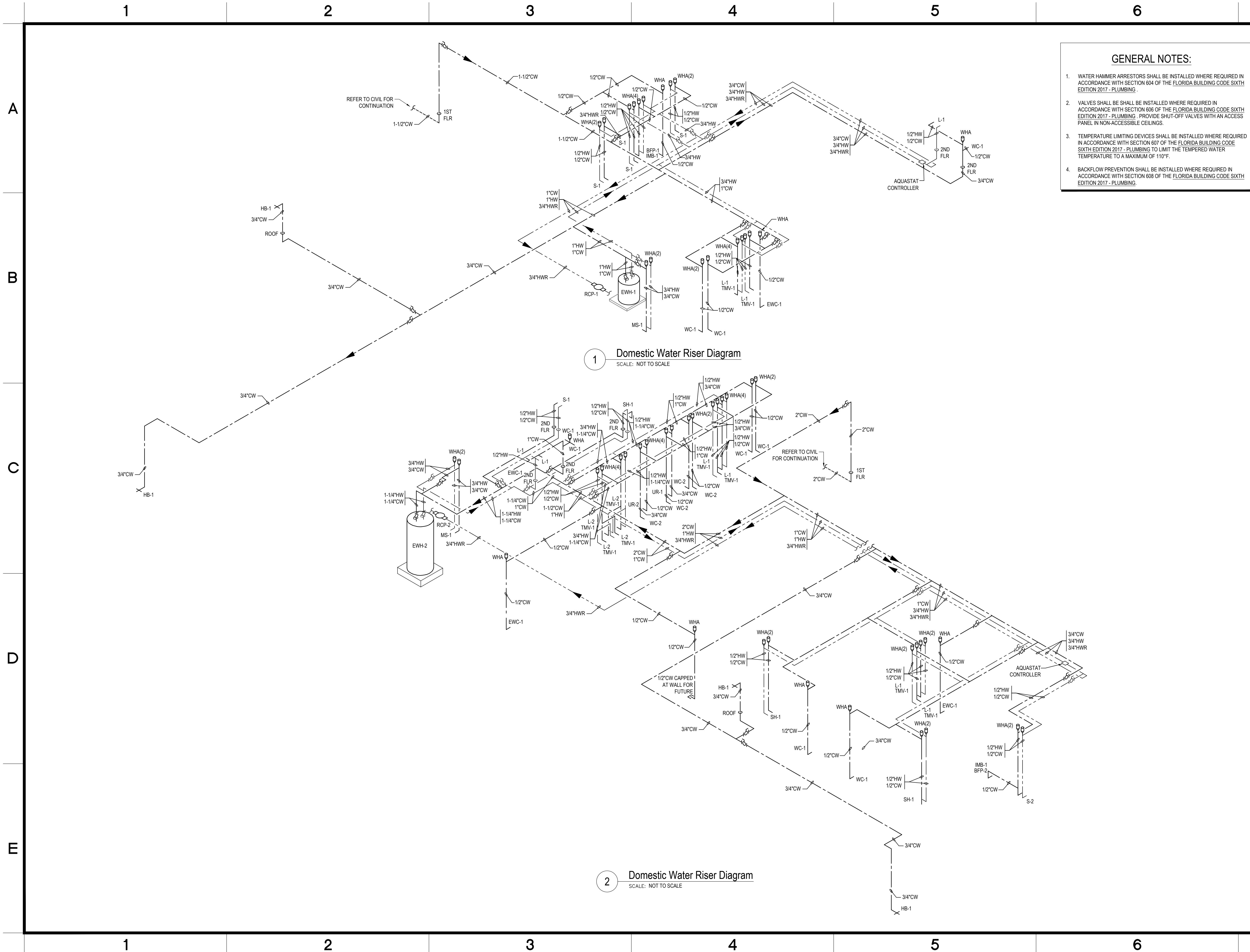
PROJECT TITLE AND ADDRESS
**BUILDING PLANS FOR:
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THE REC**
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
**RAINWATER
RISER DIAGRAMS**

MINDY NICOLE O'NEAL
LICENSE
No 69779
STATE OF FLORIDA
PROFESSIONAL ENGINEER
MINDY N. O'NEAL
FL# 69779

SHEET #
P. 6.2

PROJECT # 020004 DATE: 02.08.2020

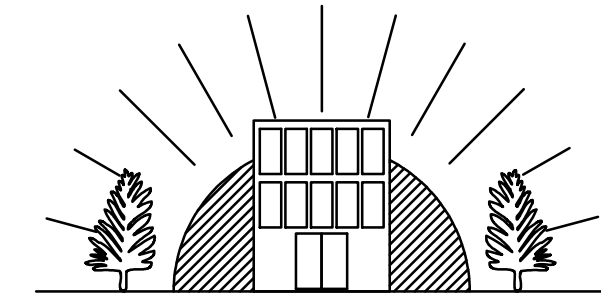


GENERAL NOTES:

1. WATER HAMMER ARRESTORS SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 604 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING .
2. VALVES SHALL BE SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 606 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING . PROVIDE SHUT-OFF VALVES WITH AN ACCESS PANEL IN NON-ACCESSIBLE CEILINGS.
3. TEMPERATURE LIMITING DEVICES SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 607 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING . PROVIDE SHUT-OFF VALVES WITH AN ACCESS PANEL IN NON-ACCESSIBLE CEILINGS.
4. BACKFLOW PREVENTION SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 608 OF THE FLORIDA BUILDING CODE SIXTH EDITION 2017 - PLUMBING .



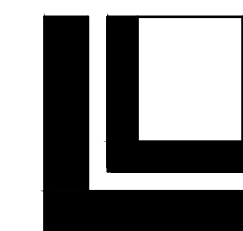
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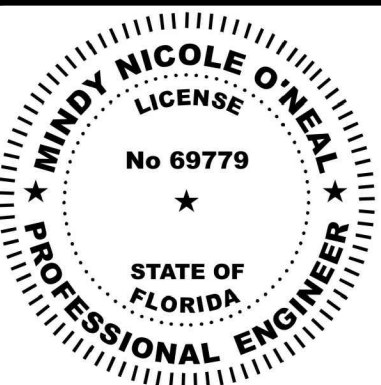
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DESIGNED BY: KMO
REVIEWED BY: MNO

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
DOMESTIC WATER
RISER DIAGRAMS



MINDY N. O'NEAL
FL# 69779

SHEET #
P7.1

PROJECT # 020004 DATE:02.08.2020

NOTE: NOT ALL ABBREVIATIONS MAY BE USED

GENERAL ELECTRICAL NOTES:

- NOTE: NOT EVERY ELECTRICAL LEGEND SYMBOL WILL BE USED

FIRE ALARM LEGEND:

NOTE: NOT EVERY FIRE ALARM LEGEND SYMBOL WILL BE USED

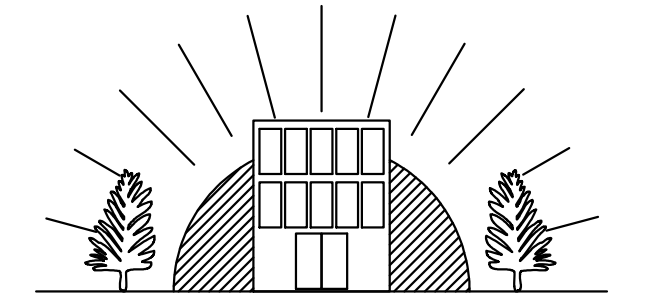
DEVICE MOUNTING HEIGHTS	
SWITCHES	48" AFF TO CENTERLINE OF DEVICE
RECEPTACLES	18" AFF TO CENTERLINE OF DEVICE
TELEPHONE / DATA OUTLET	SAME HEIGHT AS ADJACENT DEVICE
WALL MOUNTED TELEPHONE	48" AFF TO CENTERLINE OF DEVICE
TELEVISION RECEPTACLE / OUTLET	60" AFF TO CENTERLINE OF DEVICE
COUNTER HEIGHT RECEPTACLE	48" AFF TO CENTERLINE OF DEVICE OR 2" ABOVE BACKSPASH, COORDINATE WITH ARCHITECTURAL ELEVATIONS
FIRE ALARM PULL STATION	48" AFF TO CENTERLINE OF DEVICE
FIRE ALARM SPEAKER / STROBE	80" AFF TO BOTTOM OF DEVICE
EXTERIOR WALL RECEPTACLES	24" AFF TO BOTTOM OF DEVICE



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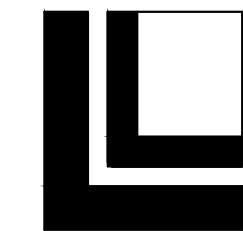
ARCHITECT:



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Goldenrod, FL 32733 C (321) 277-4128

CONSULTANTS:



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(904) 992-0377
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EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

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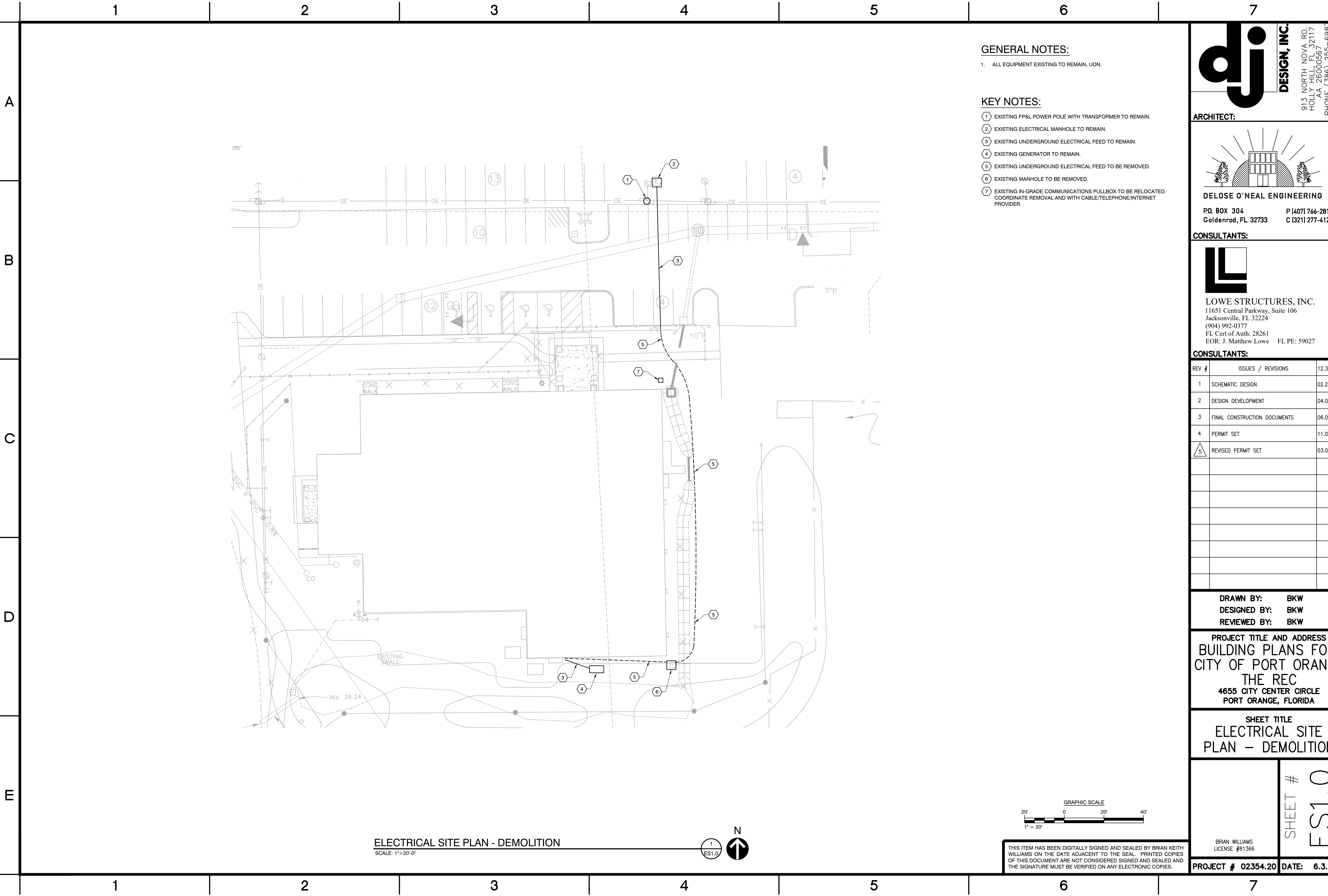
DRAWN BY: BKW
DESIGNED BY: BKW
REVIEWED BY: BKW

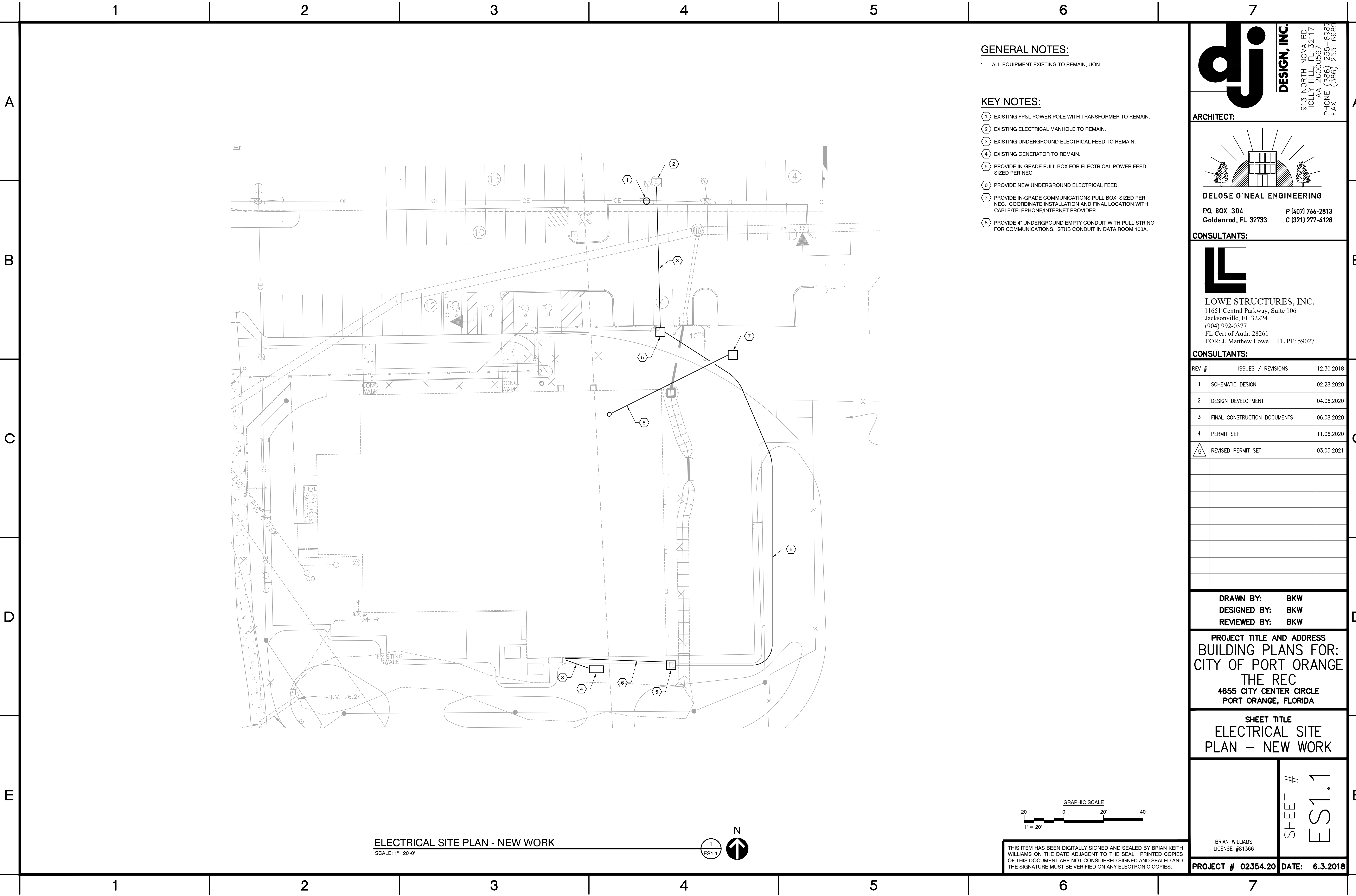
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4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

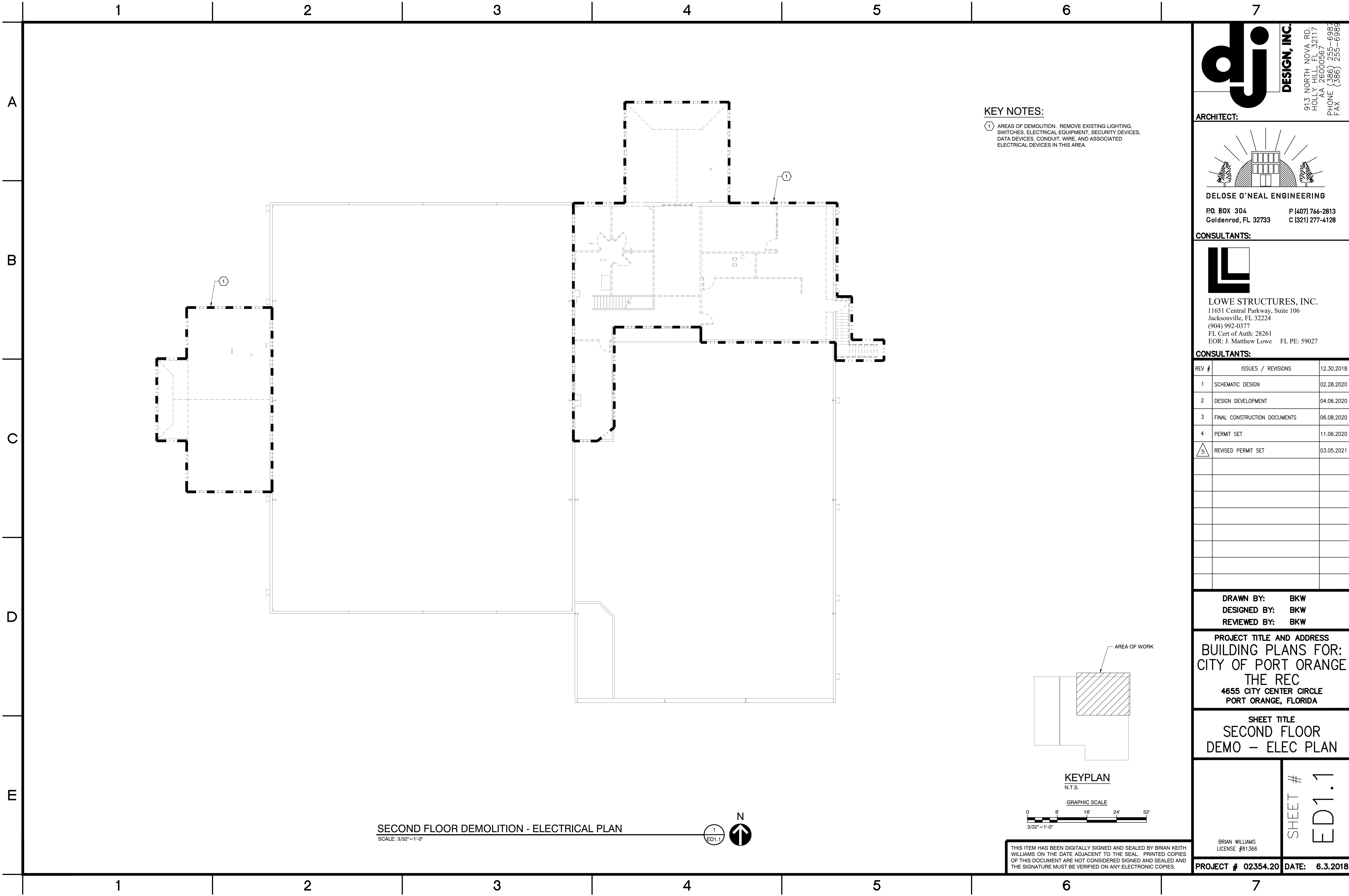
SHEET TITLE
ELECTRICAL LEGENDS
AND NOTES

BRIAN WILLIAMS
LICENSE #81366

PROJECT # 02354.20 | DATE: 6.3.2018

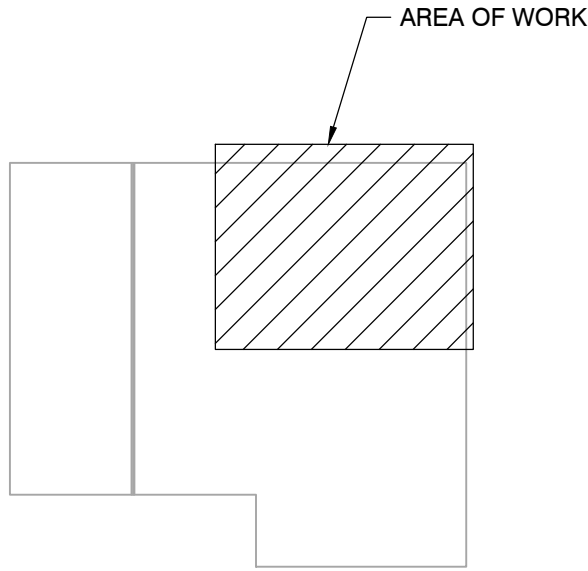




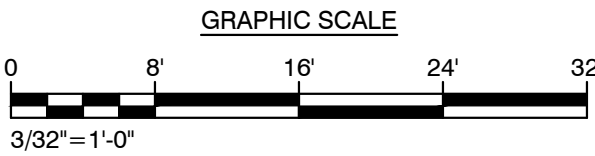


KEY NOTES:

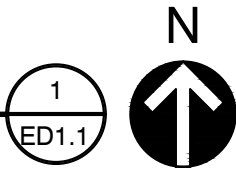
① AREAS OF DEMOLITION. REMOVE EXISTING LIGHTING, SWITCHES, ELECTRICAL EQUIPMENT, SECURITY DEVICES, DATA DEVICES, CONDUIT, WIRE, AND ASSOCIATED ELECTRICAL DEVICES IN THIS AREA.



KEYPLAN
N.T.S.



SECOND FLOOR DEMOLITION - ELECTRICAL PLAN
SCALE: 3/32"=1'-0"

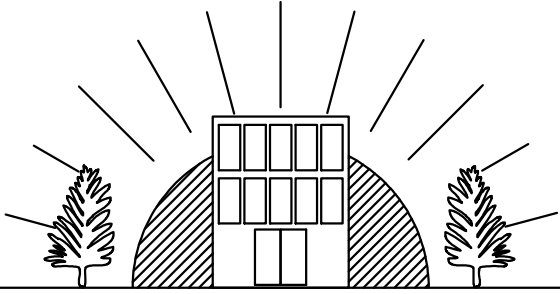


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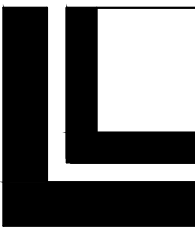


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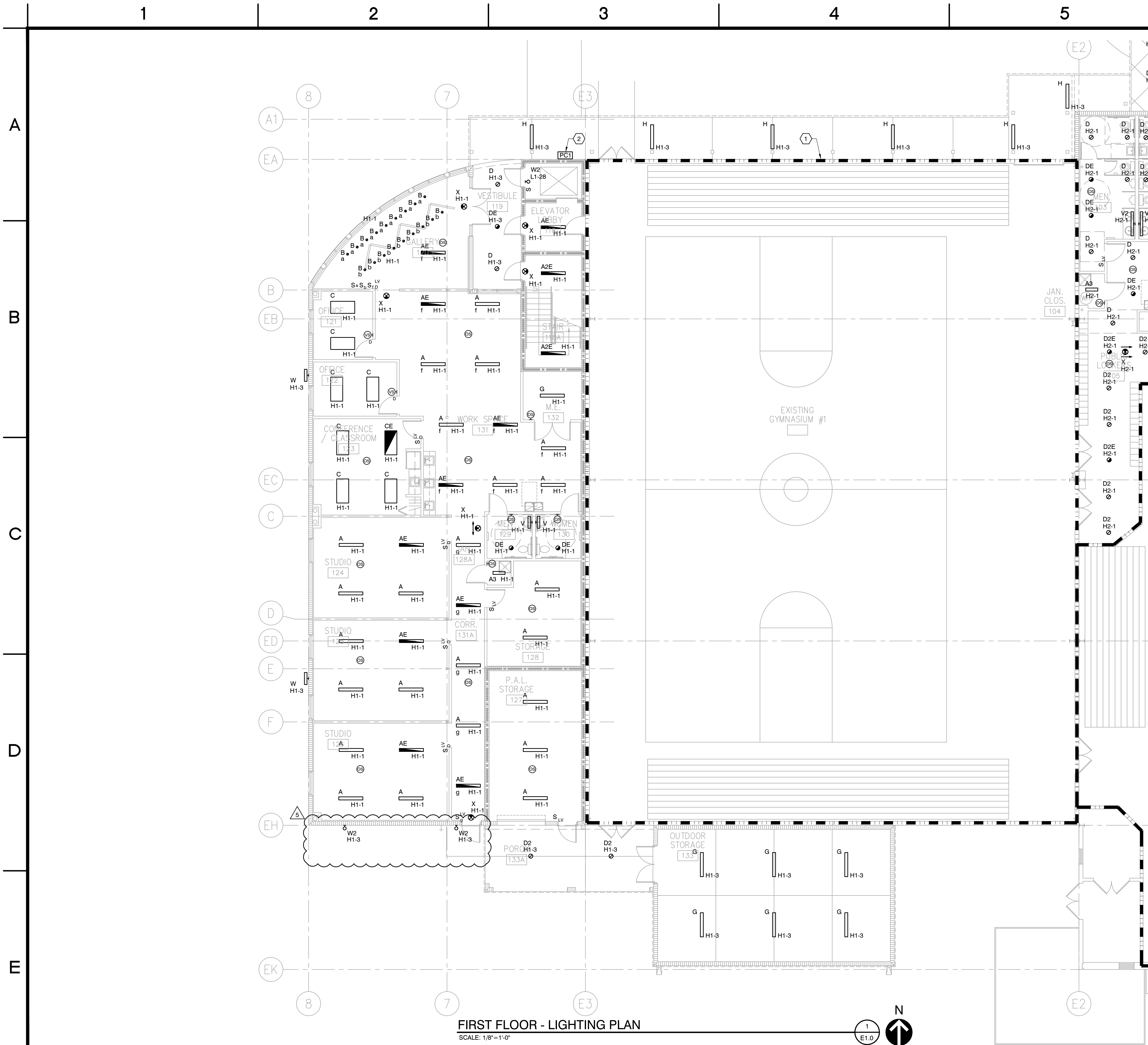
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PORT ORANGE, FLORIDA

SHEET TITLE
SECOND FLOOR
DEMO - ELEC PLAN

BRIAN WILLIAMS
LICENSE #81366

SHEET #
ED1.1

PROJECT # 02354.20 DATE: 6.3.2018



GENERAL NOTES:

1. CIRCUIT EXIT SIGNS, ELEVATOR LOBBY, AND STAIRWELL LIGHTING FIXTURES AHEAD OF LOCAL SWITCHING.

KEY NOTES:

① NO NEW WORK IN THIS AREA. WORK SHALL BE LIMITED TO RE-FEEDING EXISTING CIRCUITS FROM THE NEW PANELS. EXISTING LIGHTING TO BE RE-FED FROM PANEL L2. REFER TO PANEL SCHEDULES FOR CIRCUITS TO BE RE-FED.

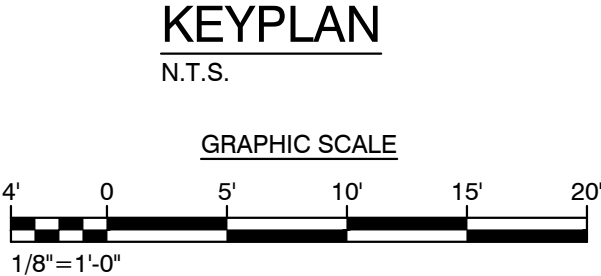
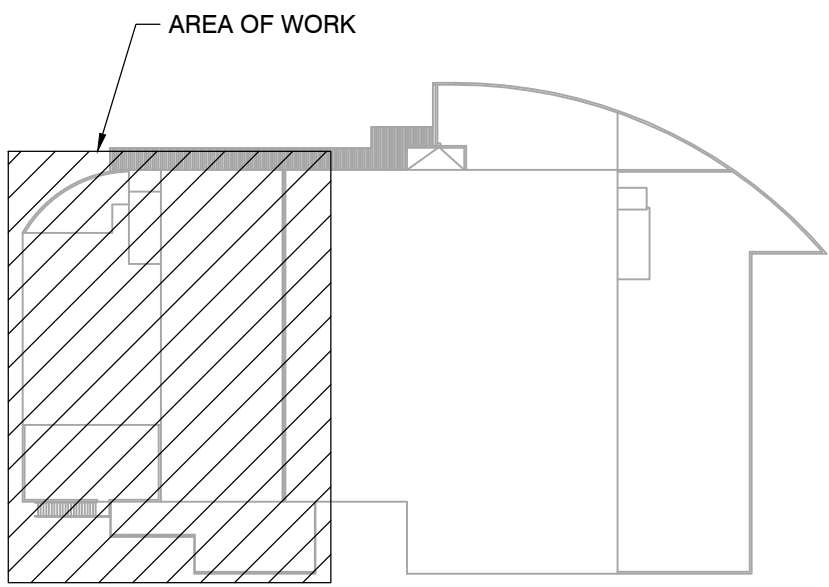
② PHOTOCELL CONTROLS CIRCUIT H1-3.

SHEET NOTES:

SERVICE HAS BEEN SIZED FOR MAXIMUM 2% VOLTAGE DROP AT DESIGN LOAD. BRANCH CIRCUITS HAVE BEEN SIZED FOR MAXIMUM 3% VOLTAGE DROP AT DESIGN LOAD. VOLTAGE DROP FOR FEEDERS AND BRANCH CIRCUITS COMBINED HAVE BEEN SIZED FOR A MAXIMUM OF 5% VOLTAGE DROP PER FBC-EC C405.6.3.

120V RECEPTACLE AND LIGHTING BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED BASED ON THE FOLLOWING CONDUCTOR LENGTHS:

2#12, 1#12G, 3/4"C	MAX 65'
2#10, 1#10G, 3/4"C	MAX 110'
2#8, 1#8G, 3/4"C	MAX 170'
2#6, 1#6G, 1"C	MAX 265'



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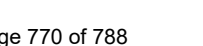
SHEET TITLE
FIRST FLOOR -
LIGHTING PLAN

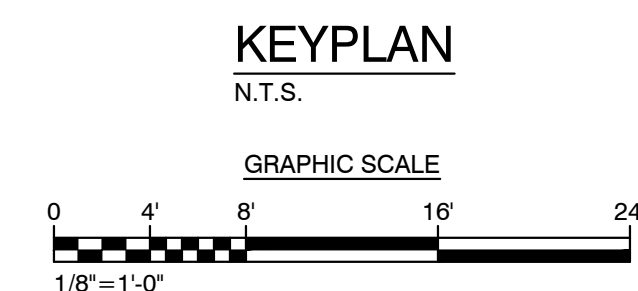
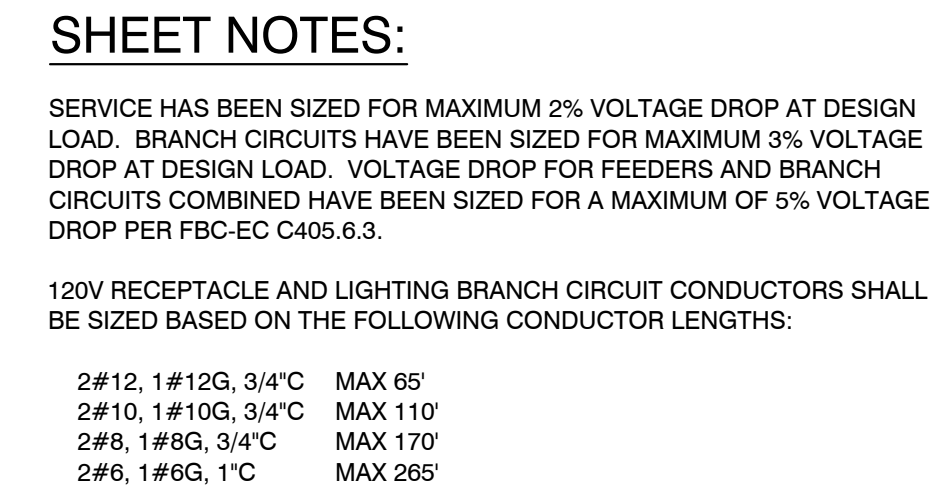
BRIAN WILLIAMS
LICENSE #81366

PROJECT # 02354.20

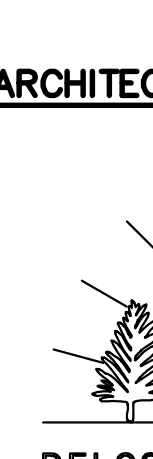
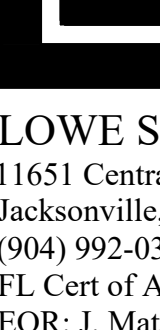
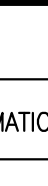
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SHEET #
E1.0

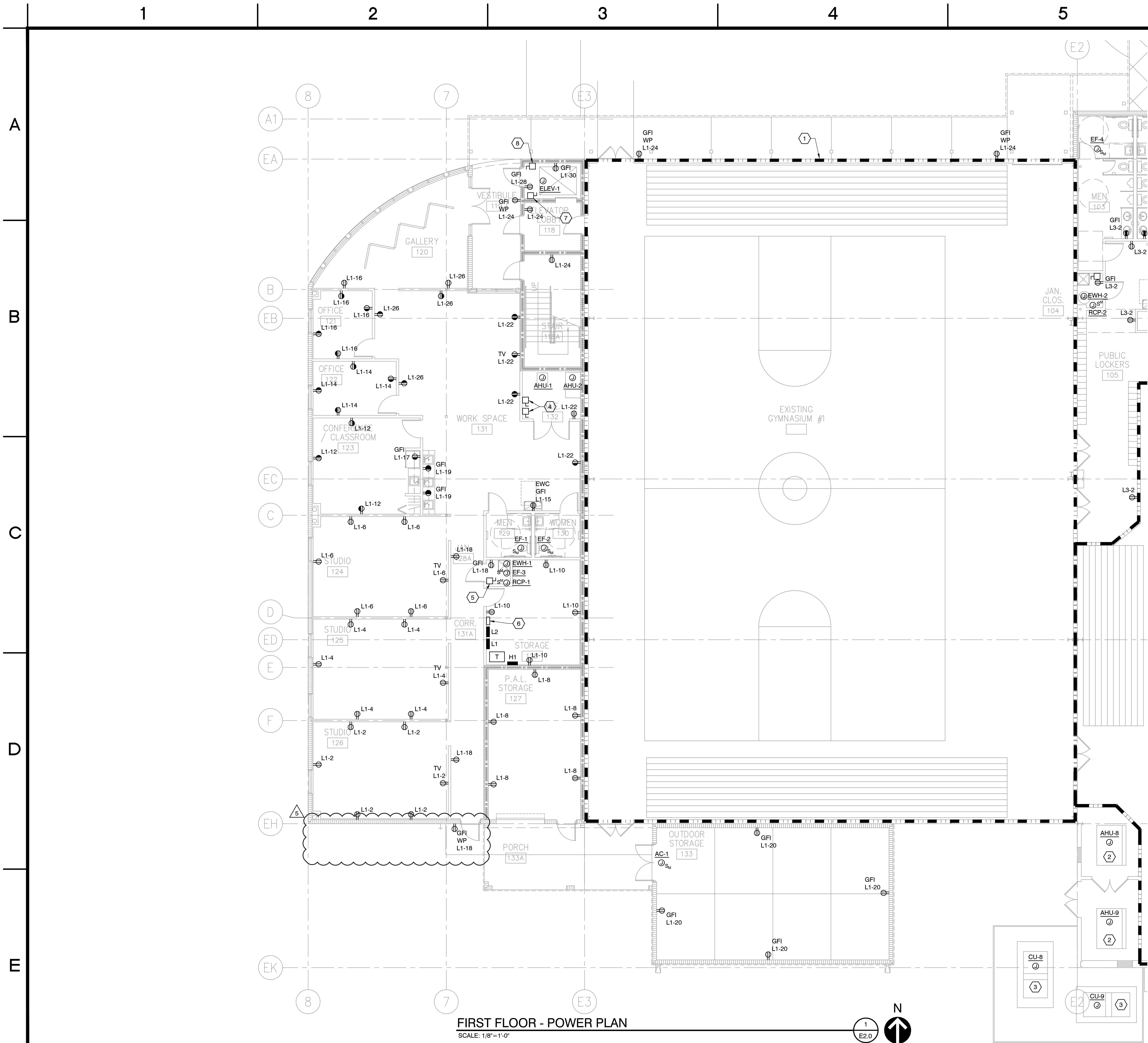




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ARCHITECT:		
 DELOSE O'NEAL ENGINEERING P.O. BOX 304 P (407) 766-2813 Goldenrod, FL 32733 C (321) 277-4128		
CONSULTANTS:		
 LOWE STRUCTURES, INC. 11651 Central Parkway, Suite 106 Jacksonville, FL 32224 (904) 992-0377 FL Cert of Auth: 28261 EOR: J. Matthew Lowe FL PE: 59027		
CONSULTANTS:		
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4	PERMIT SET	11.06.2020
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DRAWN BY: BKW		
DESIGNED BY: BKW		
REVIEWED BY: BKW		
PROJECT TITLE AND ADDRESS		
BUILDING PLANS FOR: CITY OF PORT ORANGE THE REC 4655 CITY CENTER CIRCLE PORT ORANGE, FLORIDA		
SHEET TITLE		
SECOND FLOOR – LIGHTING PLAN		
BRIAN WILLIAMS LICENSE #81366	SHEET # E1.2	
PROJECT # 02354.20		DATE: 6.3.2018





GENERAL NOTES:

1. REFER TO EQUIPMENT CONNECTION SCHEDULE ON SHEET E7.0 FOR ADDITIONAL INFORMATION.

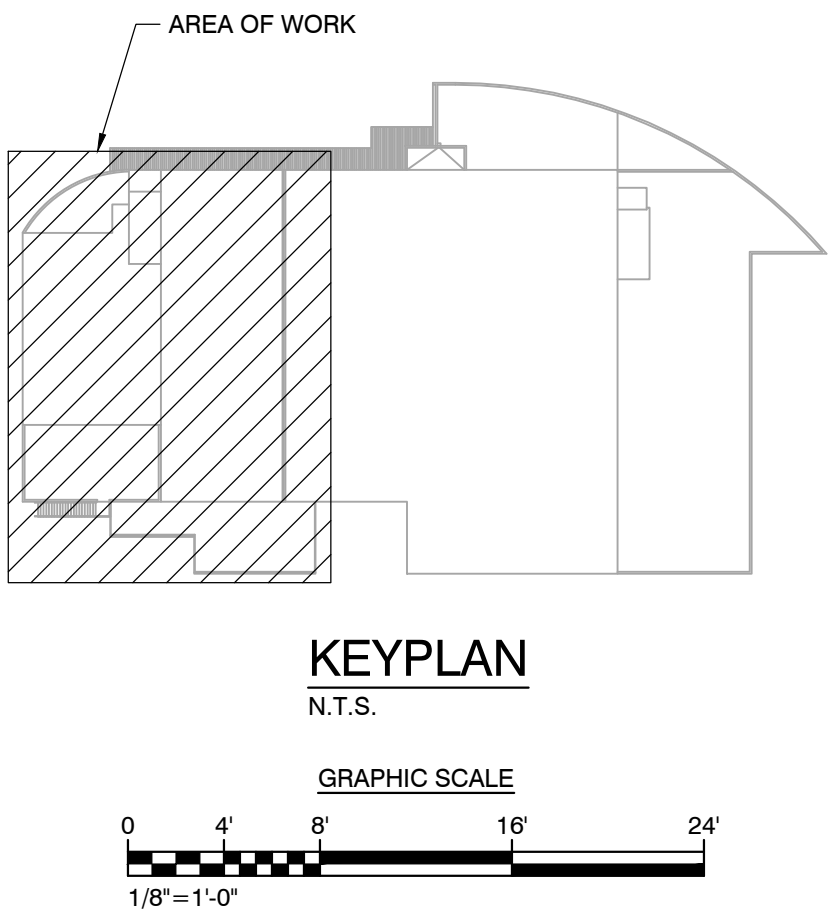
- KEY NOTES:**
- 1 NO NEW WORK IN THIS AREA. WORK SHALL BE LIMITED TO RE-FEEDING EXISTING CIRCUITS FROM THE NEW PANELS.
 - 2 BID ALTERNATIVE: EXISTING AIR HANDLING UNIT, FED FROM MDP, TO BE REMOVED AND REPLACED.
 - 3 BID ALTERNATIVE: EXISTING CONDENSING UNIT, FED FROM MDP, TO BE REMOVED AND REPLACED.
 - 4 PROVIDE DISCONNECT SWITCH FOR AIR HANDLING UNIT.
 - 5 PROVIDE DISCONNECT SWITCH FOR ELECTRIC WATER HEATER.
 - 6 NEW LOCATION OF LIGHTING CONTACTOR FEEDING GYMNASIUM LIGHTING.
 - 7 PROVIDE DISCONNECT SWITCH WITH SHUNT TRIP AND FIRE ALARM RELAY FOR ELEVATOR POWER.
 - 8 PROVIDE DISCONNECT SWITCH FOR ELEVATOR CAB LIGHTING AND RECEPTACLES.

SHEET NOTES:

SERVICE HAS BEEN SIZED FOR MAXIMUM 2% VOLTAGE DROP AT DESIGN LOAD. BRANCH CIRCUITS HAVE BEEN SIZED FOR MAXIMUM 3% VOLTAGE DROP AT DESIGN LOAD. VOLTAGE DROP FOR FEEDERS AND BRANCH CIRCUITS COMBINED HAVE BEEN SIZED FOR A MAXIMUM OF 5% VOLTAGE DROP PER FBC-EC C405.6.3.

120V RECEPTACLE AND LIGHTING BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED BASED ON THE FOLLOWING CONDUCTOR LENGTHS:

2#12, 1#12G, 3/4" C	MAX 65'
2#10, 1#10G, 3/4" C	MAX 110'
2#8, 1#8G, 3/4" C	MAX 170'
2#6, 1#6G, 1" C	MAX 265'



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ARCHITECT:

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P (407) 766-2813
C (321) 277-4128

CONSULTANTS:

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DESIGNED BY: BKW
REVIEWED BY: BKW

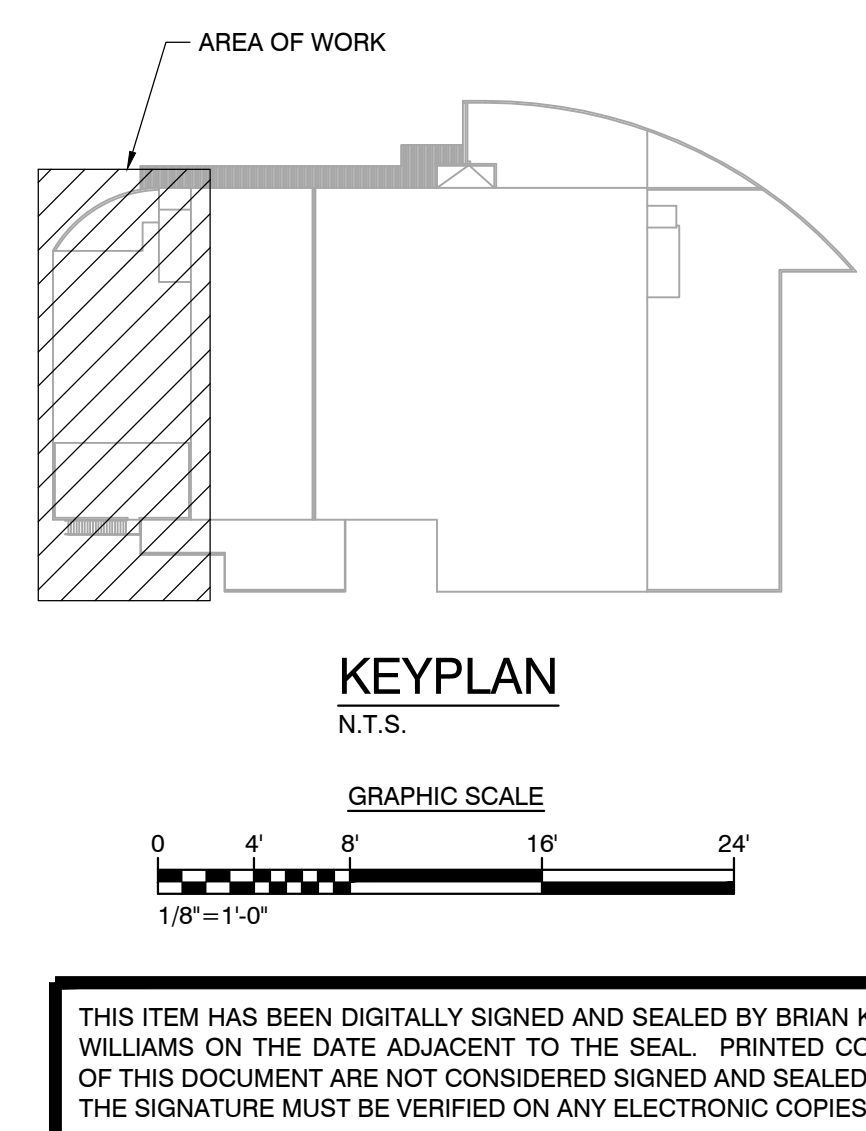
PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
FIRST FLOOR -
POWER PLAN

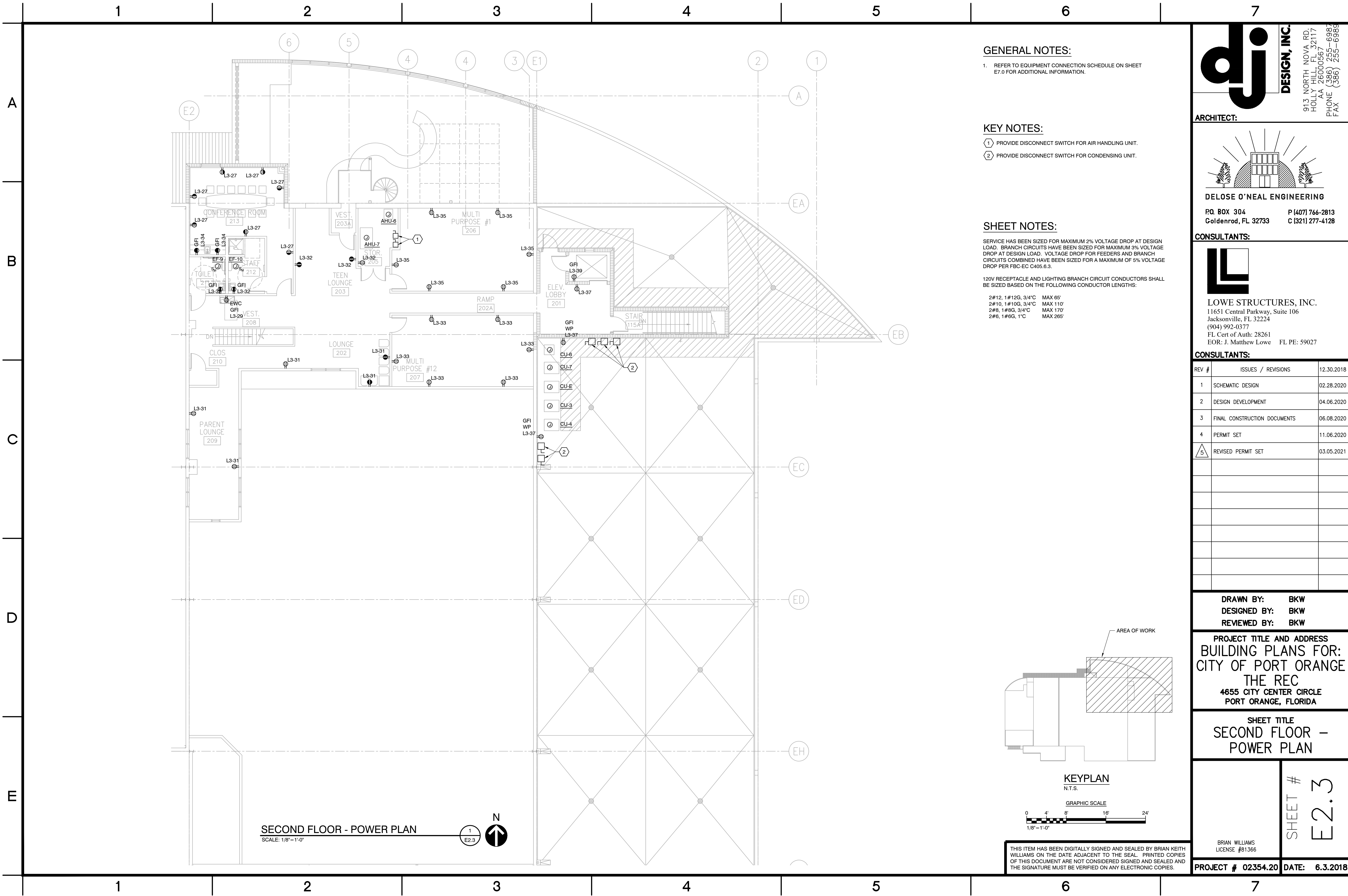
BRIAN WILLIAMS
LICENSE #81366

PROJECT # 02354.20 DATE: 6.3.2018

SHEET #
E2.0



Page 775 of 788



GENERAL NOTES:

1. REFER TO EQUIPMENT CONNECTION SCHEDULE ON SHEET E7.0 FOR ADDITIONAL INFORMATION.

KEY NOTES:

① PROVIDE DISCONNECT SWITCH FOR AIR HANDLING UNIT.

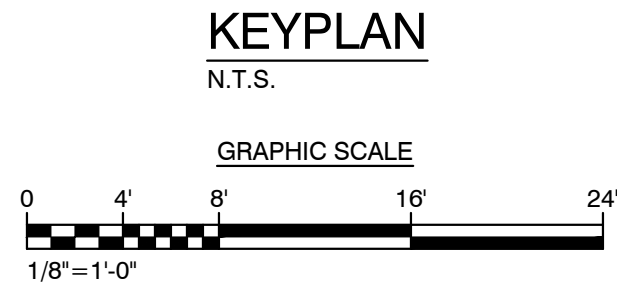
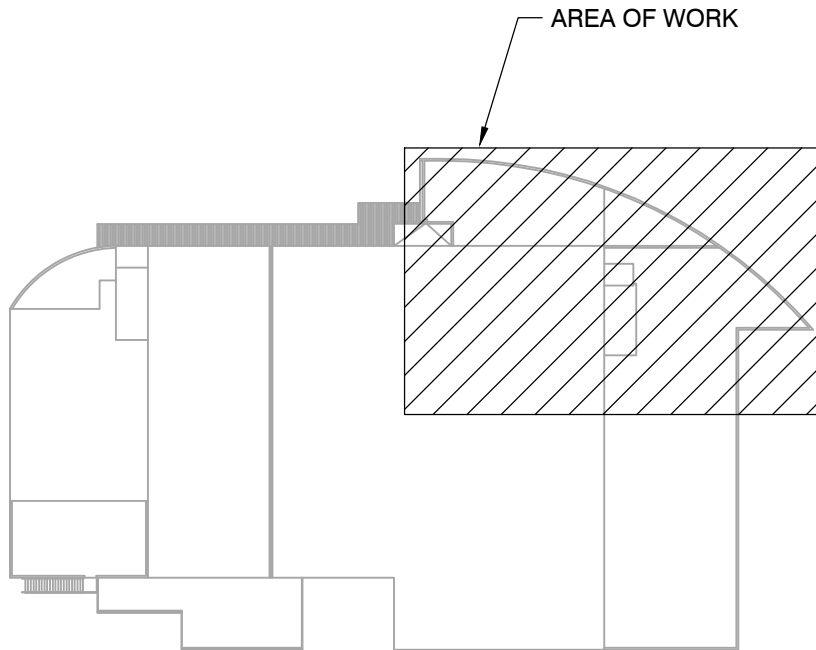
② PROVIDE DISCONNECT SWITCH FOR CONDENSING UNIT.

SHEET NOTES:

SERVICE HAS BEEN SIZED FOR MAXIMUM 2% VOLTAGE DROP AT DESIGN LOAD. BRANCH CIRCUITS HAVE BEEN SIZED FOR MAXIMUM 3% VOLTAGE DROP AT DESIGN LOAD. VOLTAGE DROP FOR FEEDERS AND BRANCH CIRCUITS COMBINED HAVE BEEN SIZED FOR A MAXIMUM OF 5% VOLTAGE DROP PER FBC-EC C405.6.3.

120V RECEPTACLE AND LIGHTING BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED BASED ON THE FOLLOWING CONDUCTOR LENGTHS:

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2#10, 1#10G, 3/4" C	MAX 110'
2#8, 1#8G, 3/4" C	MAX 170'
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ARCHITECT:

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DRAWN BY: BKW
DESIGNED BY: BKW
REVIEWED BY: BKW

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
SECOND FLOOR –
POWER PLAN

SHEET #
E2.3

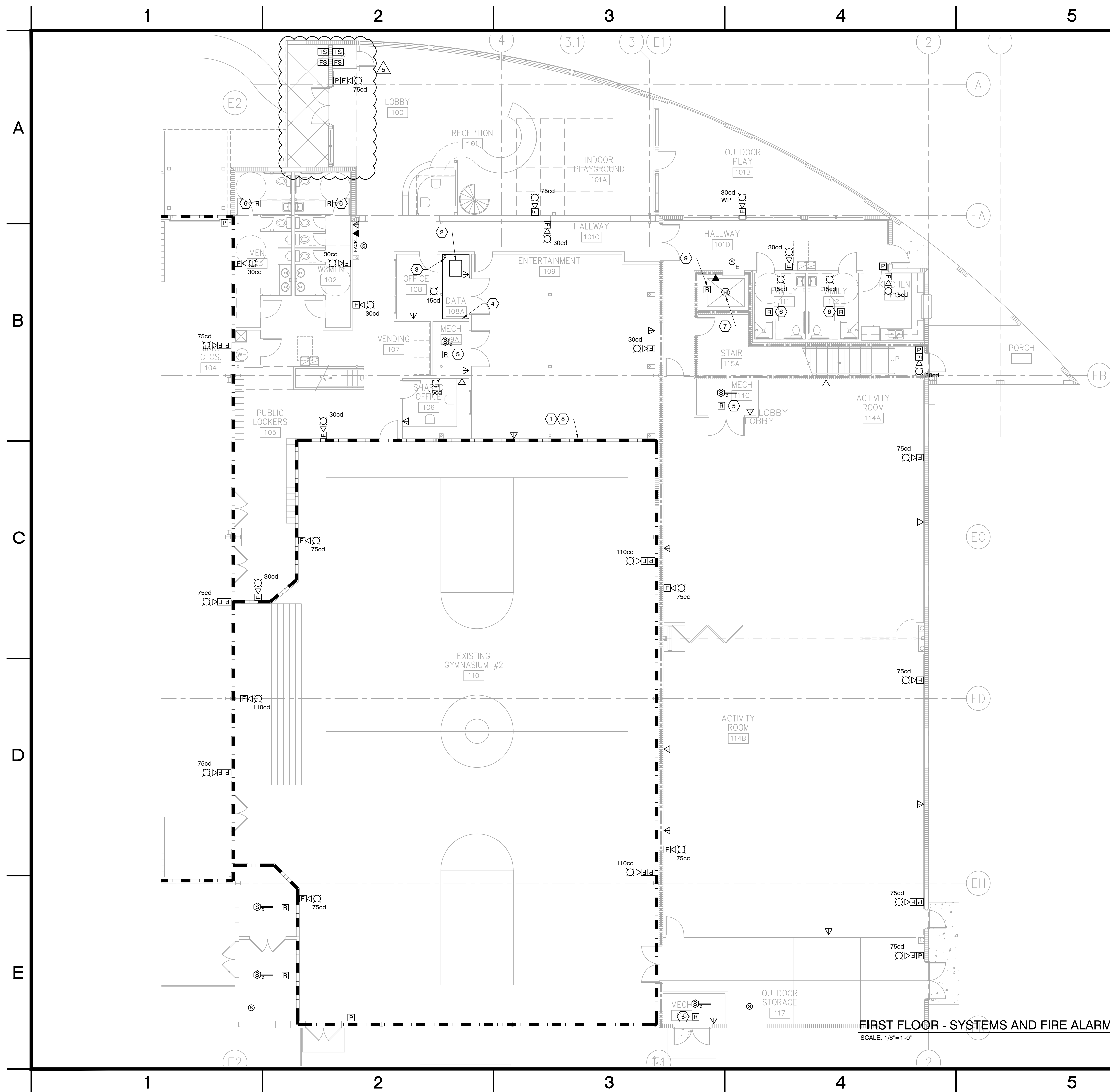
BRIAN WILLIAMS
LICENSE #81366

PROJECT # 02354.20 **DATE: 6.3.2018**



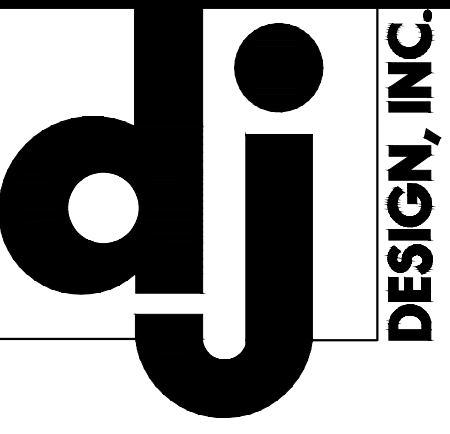
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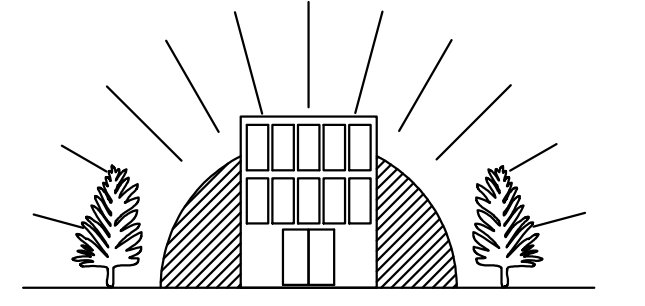
KEY NOTES:

- 1 PROVIDE 1" CONDUIT TO DATA ROOM 108A FOR ALL EXISTING COMMUNICATION DEVICES IN EXISTING AREA.
- 2 RELOCATED SERVER.
- 3 PROVIDE 4" EMPTY CONDUIT WITH PULL STRING. STUB UP 4" ABOVE FINISHED FLOOR AND CAP.
- 4 PROVIDE PLYWOOD BACKBOARD.
- 5 PROVIDE FIRE ALARM RELAY FOR AIR HANDLING UNIT SHUTDOWN.
- 6 PROVIDE FIRE ALARM RELAY FOR EXHAUST FAN UNIT SHUTDOWN.
- 7 IF SPRINKLER HEADS ARE INSTALLED, PROVIDE HEAT DETECTORS ON ELEVATOR SHUTDOWN. MOUNT WITHIN 24" OF SPRINKLER HEAD.
- 8 PROVIDE DEVICE GUARDS FOR ALL FIRE ALARM DEVICES IN THIS AREA.
- 9 PROVIDE FIRE ALARM RELAY FOR ELEVATOR POWER SHUTDOWN.



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ARCHITECT:

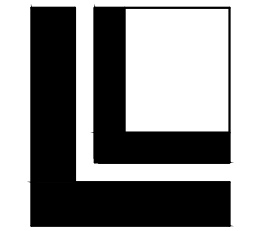


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C (321) 277-4128

CONSULTANTS:



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Jacksonville, FL 32224
(904) 992-0377
FL Cert of Auth: 28261
EOR: J. Matthew Lowe FL PE: 59027

CONSULTANTS:

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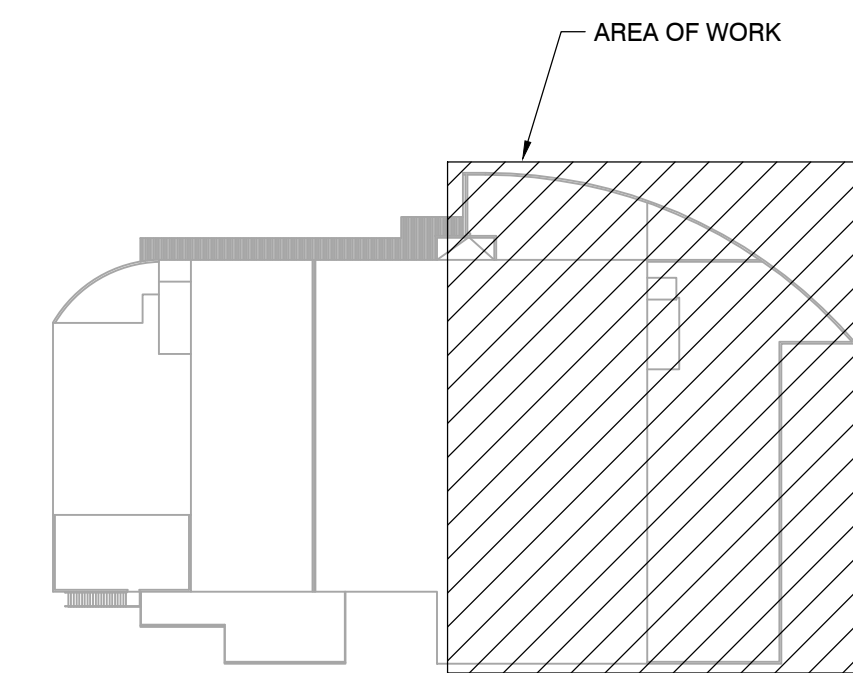
DRAWN BY: BKW
DESIGNED BY: BKW
REVIEWED BY: BKW

PROJECT TITLE AND ADDRESS
BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
FIRST FLOOR —
SYSTEMS & FA PLAN

BRIAN WILLIAMS
LICENSE #81366

PROJECT # 02354.20	DATE: 6.3.2018
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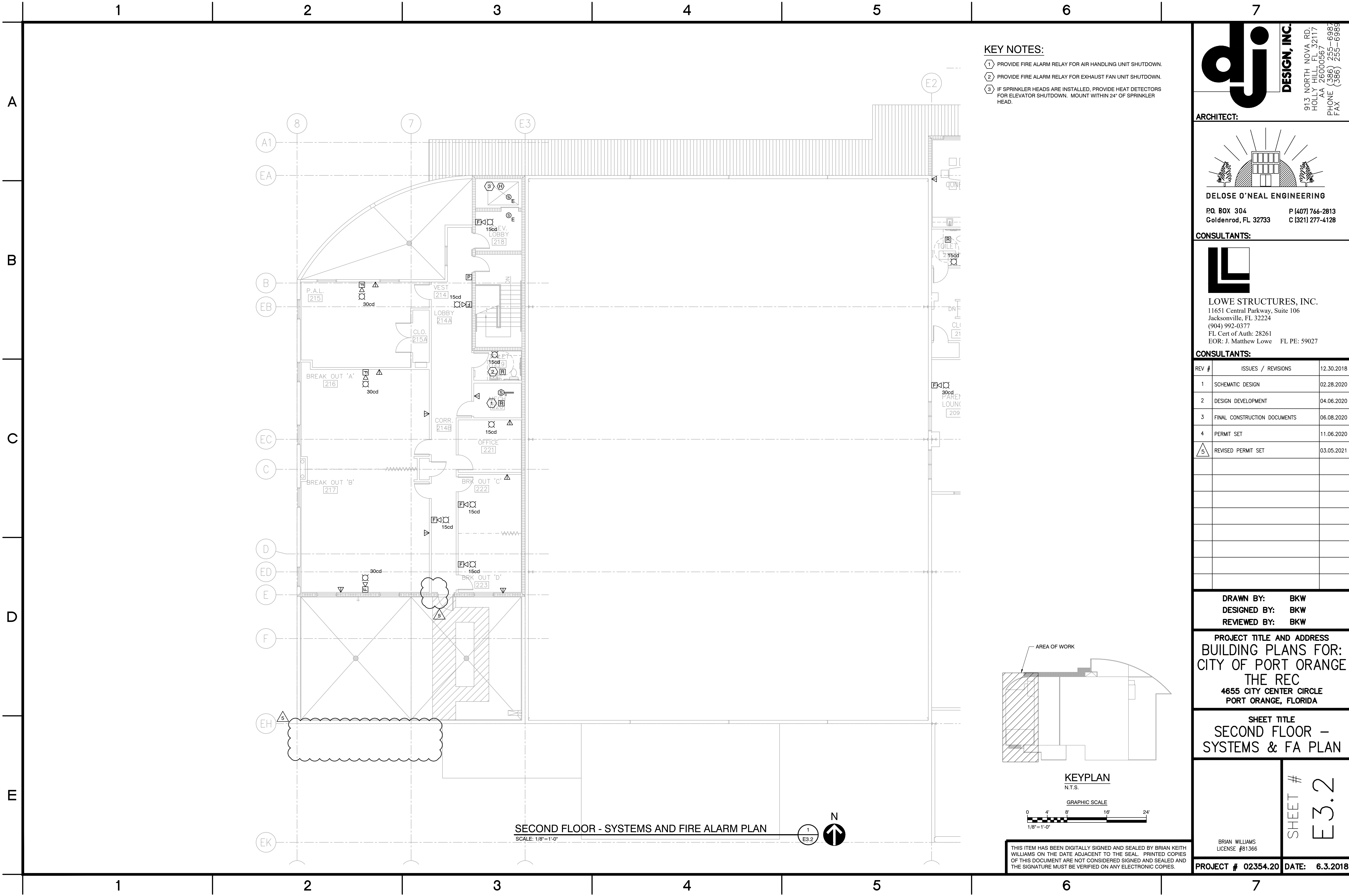
KEYPLAN
N.T.S.

GRAPHIC SCALE



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E3.1



- KEY NOTES:
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 - 2 PROVIDE FIRE ALARM RELAY FOR EXHAUST FAN UNIT SHUTDOWN.
 - 3 IF SPRINKLER HEADS ARE INSTALLED, PROVIDE HEAT DETECTORS FOR ELEVATOR SHUTDOWN. MOUNT WITHIN 24" OF SPRINKLER HEAD.

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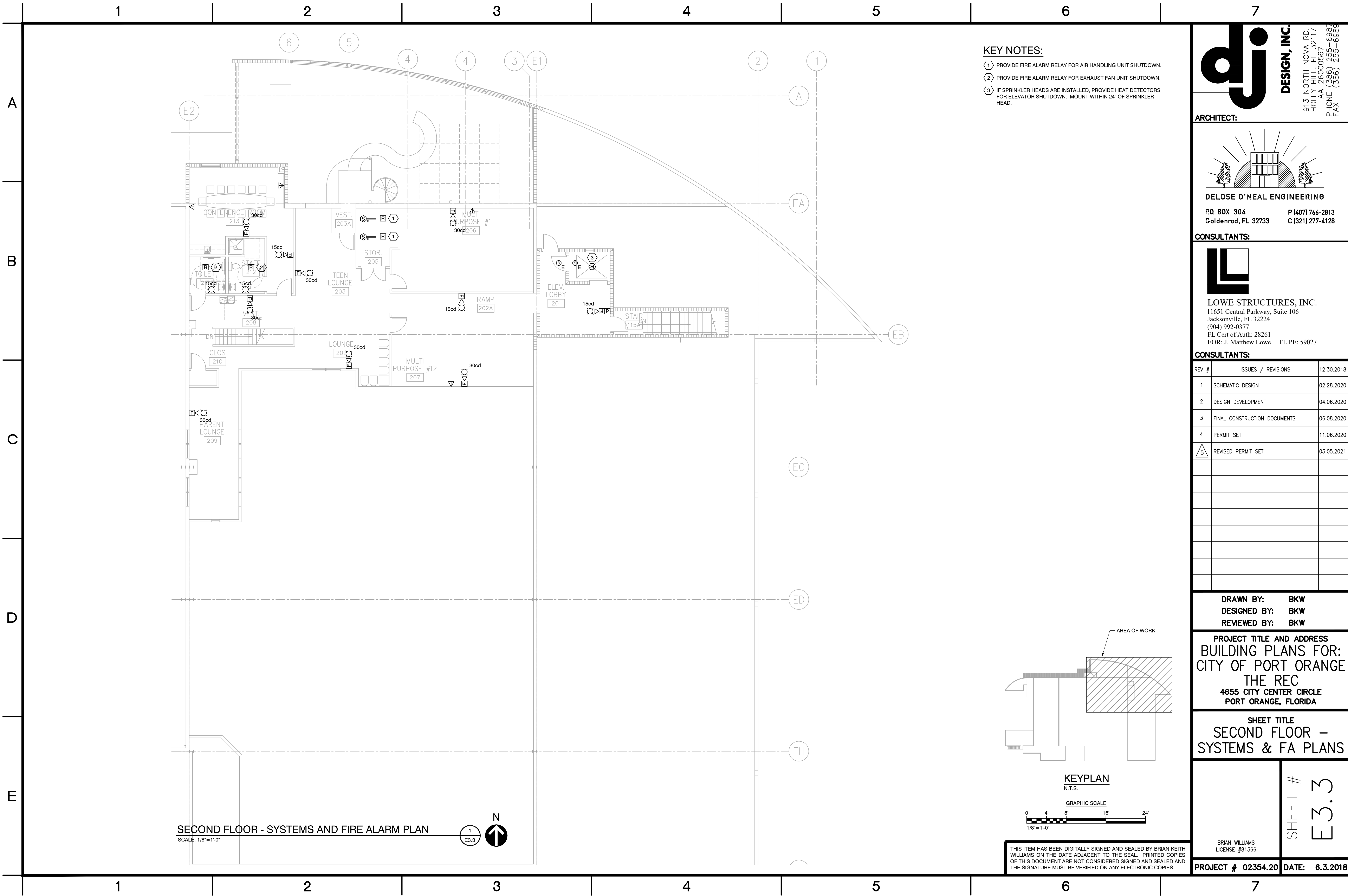
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BUILDING PLANS FOR:
CITY OF PORT ORANGE
THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE
SECOND FLOOR -
SYSTEMS & FA PLAN

BRIAN WILLIAMS
LICENSE #81366

SHEET #
E3.2

PROJECT # 02354.20 DATE: 6.3.2018



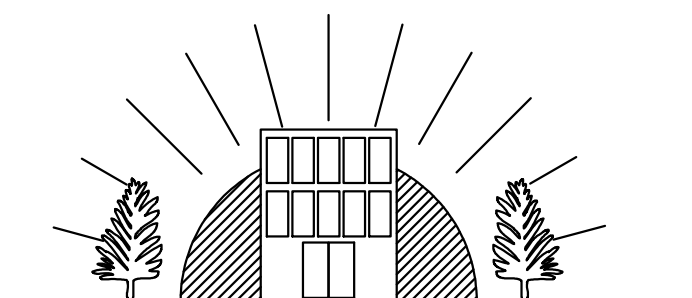
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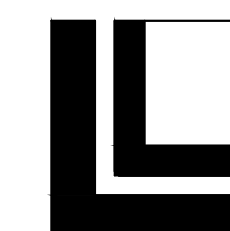


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DESIGNED BY: BKW
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PROJECT TITLE AND ADDRESS

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THE REC
4655 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA

SHEET TITLE

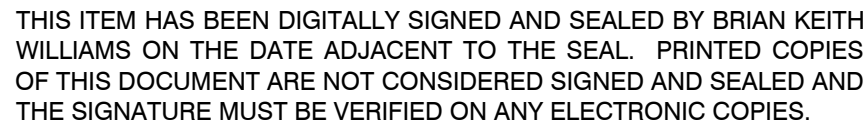
SECOND FLOOR –
SYSTEMS & FA PLANS

BRIAN WILLIAMS
LICENSE #81366

SHEET #
E3.3

PROJECT # 02354.20

DATE: 6.3.2018



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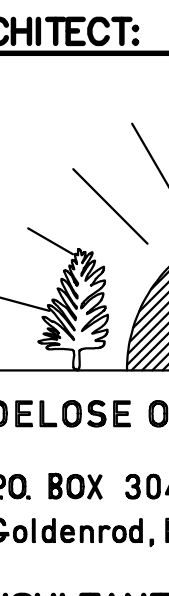


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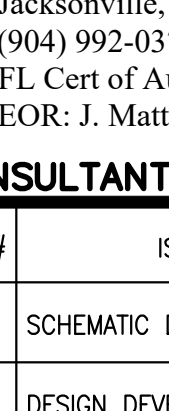
PROJECT # 02354.20	DATE: 6.3.2018
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* NOTES: EQUIPMENT PROVIDED UNDER BID ALTERNATIVE

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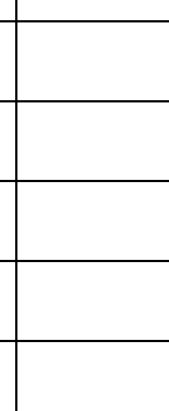
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DESIGNED BY: **BKW**

REVIEWED BY: **BKW**

PROJECT TITLE AND ADDRESS

BUILDING PLANS FOR:

CITY OF PORT ORANGE

THE REC

4655 CITY CENTER CIRCLE

PORT ORANGE, FLORIDA

SHEET TITLE

ELECTRICAL

SCHEDULES

SHEET #

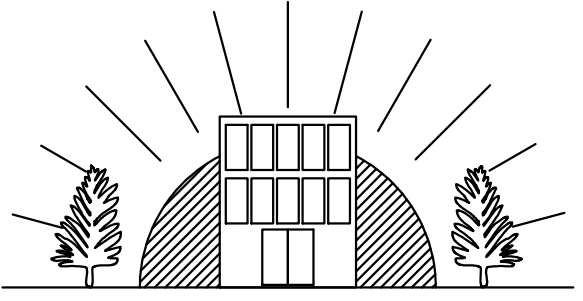
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PROJECT # 02354.20

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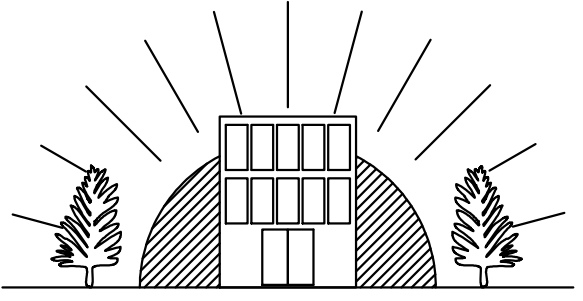
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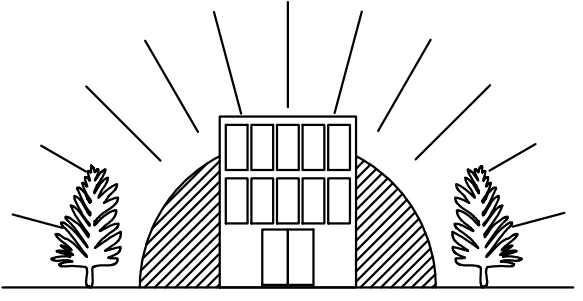
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CONSULTANTS:

REV #



CITY OF PORT ORANGE

PURCHASING DIVISION
1000 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA 32129
TELEPHONE 386-506-5704
purchdiv@port-orange.org

ADDENDUM NO. #1

March 30, 2021

ITB #21-13 Renovation and Expansion of the REC

To All Bidders:

The following changes, clarifications and additions are hereby made part of the bidding and specifications for the above referenced project dated March 12, 2021 and prepared by the City of Port Orange Purchasing Division as fully and completely as if the same were fully set forth therein. It is the sole responsibility of bidder to confirm that all addenda have been received prior to submitting bid and acknowledge such in the bid documents.

A. CLARIFICATIONS

1. After review by the department and project engineer, the following product: ***Taraflex Sport M+***, has been deemed acceptable as an alternate under Section 096516, 2.1 (A).
2. After review by the department and project engineer, the following product: ***SIKA***, has been deemed acceptable as an alternate KEE product.
3. The Port Orange REC will be **open and available** to interested bidders from **12pm-2pm, Monday through Friday (*excluding Holidays*)**. Please check in with the front desk, and let them know why you are there, and City Parks and Recreation staff will provide you access to the facility.

B. CHANGES TO SPECIFICATIONS

1. The following link has been added to Section 3 via this Addendum No. 1 with access to all pertinent drawings for the project:
<https://portorange.sharepoint.com/:f:/g/pch/EndENGElQRxLnd85KRgMtkgB03M62C3W6sfU2722OJvANw?e=dBh0Rp>
2. Section 096519, 2.1 shall now read ***"Luxury Vinyl Floor Tile"***.
3. Section 096519, 2.1, Item 1 shall now read ***"Shaw Contract"***.
4. Section 096519, 2.2, Item 1 shall now read ***"Shaw Contract"***.

C. QUESTIONS AND ANSWERS

Question 1: What is the estimated budget for this project?

Answer: The estimated budget for the project is \$3,000,000.00.

Question 2: What is the anticipated start and final completion date?

Answer: June 1, 2021 start date with a final completion date of April 1, 2022.

Question 3: Is the City furnishing any materials? If so, please list the items.

Answer: No.

Question 4: Who contracts and pays for third party independent testing? Please clarify.

Answer: The general contractor.

Question 5: Are there any DBE/WMBE goals?

Answer: No.

Question 6: What are the working hours for the contractor?

Answer: 7am-7pm Monday through Friday. No holidays. Weekend work can occur with written permission.

Question 7: Due to COVID-19, will the City accept electronic bid submissions?

Answer: No, the City is not accepting electronic bid submissions. Please ensure to include a USB Flash Drive or CD with your physical submission.

Question 8: Do we need to include building permit and impact fees in our bid?

Answer: Yes, all fees. The General Contractor is to pay for all applicable permits/fees.

Question 9: What is the last date for questions?

Answer: The last day for questions is April 5th, 2021. Please familiarize yourself with the ITB document.

Question 10: What is the process for accepting/equal manufacturers/products?

Answer: Contractor submits the request/information to Purchasing. Purchasing will forward the request/information to the department and the Engineer for review and determination. Purchasing will notify the contractor of the decision. Should it be accepted, Purchasing will add as a clarification to an Addendum.

Question 11: Does this project require Davis-Bacon wages/rates?

Answer: No.

Question 12: Does this project require E-Verify?

Answer: Yes, please see Section 5, Item 36 on Page 652 of the ITB. Please familiarize yourself with the ITB document.

Question 13: What are the liquidated damages?

Answer: \$500 per day. Please see AIA contract document, on Page 699 of the ITB.

Question 14: 102800 Toilet Accessories - The specifications state that the owner will provide the Toilet Paper Dispensers, Soap Dispenser and Paper Towel Dispensers (1.1-B). The legend on the plans state Owner Supplied and Contractor Installed (A4.0). Then your ITB had Alternate #4 that wants automatic Soap Dispensers and Paper Towel Dispensers (which model numbers will be required). So, with all of the confusion, how are we to quote this section?

Answer: Contractor will provide and install.

Question 15: 104416 Fire Extinguishers - The specification specifies the ABC extinguisher and the CD extinguishers. The plans does not state which type should be used in the locations indicated on the plans. Please have it clarified which type of extinguisher should be used in each location. On sheet A5.0, elevation 9 shows an extinguisher and cabinet mounting, will cabinets be required? Also, please confirm that only 4 extinguishers will be required for this project.

Answer: This is shown on the life safety plan and we only request ABC. Yes, cabinets are required.

Question 16: 105113 Metal Lockers - The specification is not clear on what is required for the project, generic spec. The specs and plans does not give any information (elevations) on how many Tiers the lockers are to be. Please have the architect/owner clarify what will be required. Also, the specification has information about Benches, but the plans does not show them. Will they be required, if so, where and what size?

Answer: Contractor will not be required to provide and install the lockers. The City will take care of the lockers.

Question 17: Is there an interior and exterior signage scope involved? Please confirm.

Answer: Yes, interior. There is a sign on every door with a room number.

Question 18: It appears that the structural drawings are missing. Please provide them, if missing, so we can price Steel, Concrete, and Masonry Scopes.

Answer: Please see the link to all drawings under B. CHANGES TO SPECIFICATIONS #1.

Question 19: Are there any Civil Drawings associated with this project, and a Soils Report?

Answer: Please see the link to all drawings under B. CHANGES TO SPECIFICATIONS #1.

Question 20: Do you have Formal Bid Forms, or Excel Bid Breakdown Form?

Answer: There is a Bid Form Submittal Checklist in the ITB under Section 7, Required Forms.

Question 21: The plans reference civil plans, but none have been provided. Can the City provide the civil plans?

Answer: Please see the link to all drawings under B. CHANGES TO SPECIFICATIONS #1.

Question 22: Regarding Fire Extinguishers: Specs call out for ABC Extinguisher and CD Extinguishers. Plans do not state which type should be used in the locations indicated on the drawings. Which type should be used?

Answer: Please see the answer to Question 15.

Question 26: Sheet A5.0, Elevation 9 shows an extinguisher and cabinet mounting, will the cabinets also be required?

Answer: Please see the answer to Question 15.

Question 27: Can the City provide Fire Protection drawings as they are missing although indicated on cover page/sheet?

Answer: Please see the link to all drawings under B. CHANGES TO SPECIFICATIONS #1.

Question 28: The specs suggest signage, but no indication of scope is shown on the plans. Is signage required for this project?

Answer: Please see the answer to Question 17.

Question 29: The specifications and drawings do not indicate the locker type. Can the City specify if they are 1-tier, 2-tier, 3-tier, 4-tier, 5-tier or 6-tier? Please also specify locker size or confirm if it is 12" wide and 18" deep.

Answer: Please see the answer to Question 16.

Question 30: Will we be required to pay for tap fees?

Answer: Yes.

Question 31: Has Florida Power and Light viewed these plans? Will there be any associated fees regarding this?

Answer: No, they have not. The site will have a new transformer.

Question 32: Will the site be functional and occupied while the contractor is working?

Answer: No.

Question 33: Will the playground be provided by the City?

Answer: No, it is an additive alternate and will be awarded based on budget; include it in your bid submittal.

Question 34: Are there specifications on the type of playground equipment/brand?

Answer: We don't specify brands. We ask that all playgrounds be IPEMA certified. They need to be suitable for ages 2-5 and then ages 5 and up.

Question 35: Will there be civil design drawings?

Answer: Yes, there are civil and landscape drawings.

Question 36: Is there grant money tied to this project?

Answer: Yes, this project is partially funded by Volusia ECHO Grant funding.

Michael Hall
Purchasing Agent
mhall@port-orange.org

In all other respects, except as specifically stated herein, the subject ITB #21-13 Renovation and Expansion of the REC remains unchanged.

END OF ADDENDUM NO. #1



CITY OF PORT ORANGE

PURCHASING DIVISION
1000 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA 32129
TELEPHONE 386-506-5704
purchdiv@port-orange.org

ADDENDUM NO. #2

April 12, 2021

ITB #21-13 Renovation and Expansion of the REC

To All Bidders:

The following changes, clarifications and additions are hereby made part of the bidding and specifications for the above referenced project dated March 12, 2021 and prepared by the City of Port Orange Purchasing Division as fully and completely as if the same were fully set forth therein. It is the sole responsibility of bidder to confirm that all addenda have been received prior to submitting bid and acknowledge such in the bid documents.

A. CLARIFICATIONS

Acoustical Ceiling materials for the project; Manufacturer, Color Type and Size:
Please refer to See Section 095113, 2.2B thru 2.2K.

Model numbers required for question 14, Addendum No.1, "102800 Toilet Accessories":
*The user has decided to make the GC responsible for providing (furnishing and installing) the Toilet Accessories as scheduled on the Toilet Accessories Legend, Sheet A4.0 as the Base Bid. Alternate #4; **Bobrick** B72974 Automatic, surface-mounted paper towel dispenser and **Bobrick** B-2012 Automatic, wall-mounted soap dispenser.*

Please note the following is related to Elevator Specifications:

1.5; Calls for 60 months of preventive maintenance to be included. This is typically 12 months since it would be an operating cost not a capital cost. Please advise if this should be 12 months.

Length of time is 12 months.

2.6.A.2; calls for various wall and car door finishes. Also, in 2.9.A.4.g – calls for Enamel car door, 2.9.A.4.f calls for laminate walls. Please define the requirement for this project.

Requirements are Stainless steel doors, laminate walls.

2.7.B.1; Calls for various finishes for hoistway entrance doors and frames. Also noted in 2.9.A.5.e.

Stainless steel door frames, No. 4 finish.

2.9.A.3 – Calls for 200 fpm. This is not possible in 11'8". Recommend 100 fpm. Please confirm requirement.

100 fpm will suffice.

Please note the following is related to Drawing A3.3

Hoistway size of 9'4" w is beyond standard design width for all manufactures. Min. is 8'6" and max. is 9'0". Either design change or additional structural supports will be needed.

Final, approved shop drawings will set the hoistway dimensions prior to construction.

Overhead of +/- 12'-0" insufficient. Need 12'-8" minimum clear. Hoist beam to be by others and needs to be installed during hoistway construction.

Final, approved shop drawings will set the hoistway dimensions prior to construction.

No detail for East elevator. Hoistway depth due to front and rear configuration needs to be 6'5 5/8".

Final, approved shop drawings will set the hoistway dimensions prior to construction.

B. CHANGES TO SPECIFICATIONS

N/A

C. QUESTIONS AND ANSWERS

Question 1: Can you confirm if this project requires exterior site furnishings such as benches, trash receptacles, bike racks, etc.?

Answer: There are no requirements for exterior site furnishings.

Question 2: Sheet A5.1 detail 3: How is the exterior of the column finished?

Answer: The exterior of the steel column has a stucco finish.

Question 3: Roof Insulation: Cross section C / A4.1, wall section 14 / A 3.3 and Detail 13 / A 5.0 appear to show the roof insulation to be rigid and not LWIC. Should this roof be LWIC?

Answer: Since the roof structure itself slopes, we do not need lightweight concrete to create slope-to-drain. Rigid insulation with a nailable surface must achieve a R-30 insulative value.

Question 4: How deep is the tube frame work for the clear aluminum grates, I see they are 1-1/2" W but don't have the depth.

Answer: 6".

Question 5: How thick is the 1"W grate screen to be for the clear anodized aluminum grating? It appears to be 3/8" -1/2"

Answer: 1/2".

Question 6: Can the grate screen for the clear anodized aluminum grates be a separate screen that bolts onto the screen framework? This would keep costs down and eliminate any exposed weld/ grind marks that would be visible otherwise.

Answer: Yes.

Question 7: Are the 3 screens on the east elevation and the 3 on the north elevation seen on drawing A2.0 the only aluminum grates within the project?

Answer: Yes.

Question 8: Specification Sheet E5.1 Detail 3 where it shows attaching a copper system to a metal standing seam roof. The UL 96A Code states to not utilize dissimilar metals. NFPA 780 clearly states in Code 4.2.3 Lightning protection materials shall not be installed on or in contact with aluminum siding or other aluminum surfaces. Code: 4.2.4 states Aluminum lightning protection materials shall not be installed on or in contact with copper surfaces. This is pretty well known, in the industry due to it causing corrosion (Oxidation).

Answer: Dissimilar metals shall be separated by isolation tape or asphaltic coating.

Question 9: With the existing “MDP “being removed and a new one being installed we assume this the building will be without power for three (3) or more days? Or has this been addressed in sequence of work to be performed?
ANSWER: Keeping the building powered during construction was not a request made during design. It is assumed the building will be without power for the duration of the electrical switchover.

Question 10: Sheet ES1.1 – Note # 5 indicates “ Provide in grade box for electrical power feed “, but these could be FPL conduits that feed the existing MDP , so if that is the case then we are not allowed to install Junction boxes or the new conduits? It appears that the FPL transformers are pole mounted and feeds to a underground handhole that is FPL’s. This needs to be clarified more as to what needs to be included in the EC bid.
ANSWER: This will need to be coordinated with FPL. Past experiences with FPL in Volusia county have had the contractor install the handhole, conduit, and wiring. FPL would provide and install the riser, and terminate the cabling.

Question 11: Sheet E6.0 – What are the existing Conduit and Wire sizes that feed from FPL to the existing “MDP “? The new single line diagram riser indicates that we are to install “ 2 parallel sets of (4) # 350KMCIL “ copper to the new MDP , so are these new conduits or are we installing through the existing raceway after we intercept and install new?
ANSWER (2 parts):

Demolition

The contractor shall intercept the existing underground electrical service feeder at the handhole located at the base of the existing power pole and transformer. The contractor shall remove the existing underground power feed from the existing handhole to the existing service meter.

New Work

The contractor shall install an FP&L provided handhole adjacent to the power pole. It's possible the existing handhole may be re-used, but that will be for FP&L to determine. The contractor shall purchase and install (2) parallel sets of 4" Conduit from the handhole to the new service meter. Contractor shall purchase and install a pull box for the electrical feeder, as this run is roughly 375'. Conductor sizes as indicated on sheet E6.0, with the service grounding conductor revised to #2/0. Contractor shall purchase and install cable, FP&L will terminate. FP&L will provide and install the pole riser if the existing riser is not adequate for the new service.

Question 12: Should permits / fees be carried in our proposal as an allowance?

ANSWER: Per Addendum No.1, Question/Answer 8 as follows:

Question 8: Do we need to include building permit and impact fees in our bid?

Answer: Yes, all fees. The General Contractor is to pay for all applicable permits/fees.

Question 13: What is the approximate Building Permit Cost? If not available, is there a metric we should use to calculate this cost?

Answer: Please use this link to access the Building Permit Fees Table:

<https://www.port-orange.org/DocumentCenter/View/3312/Building-Permit-Fee-Schedule-Resolution-Number-13-30-and-20-14-PDF>

In all other respects, except as specifically stated herein, the subject ITB #21-13 Renovation and Expansion of the REC remains unchanged.

END OF ADDENDUM NO. #2

Joseph Castro

Buyer

jcastro@port-orange.org

SECTION 7 – REQUIRED FORMS

FORM 7.1 – BID SUBMITTAL CHECKLIST

- ☒ Form 7.2 – Bidder's Acknowledgement Form
- ☒ Form 7.3 – Addendum and Change Order Procedure Acknowledgement
- ☒ Form 7.4 – Drug Free/Tie Preference Statement
- ☒ Form 7.5 – Public Entity Crimes Statement
- ☒ Form 7.6 – Affidavit of Anti-Collusion
- ☒ Form 7.7 – Statement of Bidder's Qualifications
- ☒ Form 7.8 – Professional References for Previous Experience
- ☒ Form 7.9 – Listing of Subcontractors
- ☒ Form 7.10 – Certificate as to Corporate Principal
- ☒ Form 7.11 – Local Business Affidavit of Eligibility
- ☒ Attachment 1 – Bid Proposal
- ☒ Copy of License (Florida Certified General Contractor, Sunbiz, etc.)
- ☒ Bid Bond
- ☒ Submission of one (1) original marked "ORIGINAL" and one (1) digital (CD or flash drive) version in PDF format.

BY: Saboungi Construction, Inc.

Name of Business


Authorized Signature

April 19, 2021

Date

This document must be completed and returned with your Submittal

FORM 7.3 – ADDENDUM and CHANGE ORDER PROCEDURE ACKNOWLEDGEMENT

ADDENDUM ACKNOWLEDGEMENT

I have carefully examined the Invitation to Bid (ITB), Instructions to Bidders, General and/or Special Conditions, Specifications, and any other documents accompanying or made a part of this invitation to Bid.

I acknowledge receipt and incorporation of the following addenda, and the cost, if any, of such revisions has been included in the price of the bid proposal.

Addendum# 1 Date: 3/30/2021 Addendum# 2 Date: 4/12/2021

Addendum# _____ Date: _____ Addendum# _____ Date: _____

CHANGE ORDER PROCEDURE ACKNOWLEDGEMENT

If awarded the Contract for this Solicitation, I acknowledge that no oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders requests shall be made in writing by the Contractor for review by the Contract Administrator for the City of Port Orange. No work shall be performed as set forth in the change order until the Contractor receives an executed Purchase Order for the requested change.

I acknowledge the following statement regarding Change Orders to the awarded Contract:

Saboungi Construction, Inc.

Name of Business

By: Hassan Saboungi

Printed Name: Hassan Saboungi

Title: Vice President

STATE OF Florida

COUNTY OF Volusia

The foregoing instrument was acknowledged before me by means of X _____ physical presence or _____ online notarization, this 19th day of April, 2021, by Hassan Saboungi who is personally known to me or who produced _____ as identification.

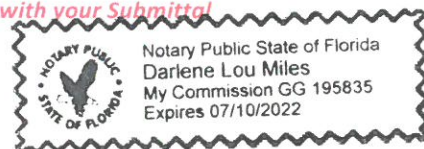
My Commission Expires: GG 195835

Darlene Lou Miles

Notary Public, State of Florida

Printed, typed or stamped name, commission and expiration:

This document must be completed and returned with your Submittal



FORM 7.4 – DRUG-FREE PREFERENCE STATEMENT

IDENTICAL TIE BIDS - Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids, proposals, statements, or replies that are equal with respect to price, quality, and service are received by the city for the procurement of commodities or contractual services, a bid received from a business that certifies that it has implemented a drug-free workplace program shall be given preference in the award process. Established procedures for processing tie bids will be followed if none of the tied bidders have a drug-free workplace program.

In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of Section 287.087, Florida Statutes.

As an authorized representative of the firm, I certify that this firm complies fully with the above requirements.

Saboungi Construction, Inc.

Name of Business

By: Hassan Saboungi

Printed Name: Hassan Saboungi

Title: Vice President

STATE OF Florida

COUNTY OF Volusia

The foregoing instrument was acknowledged before me by means of X physical presence or
online notarization, this 19th day of April, 20 21, by Hassan Saboungi who
is personally known to me or who produced _____ as identification.

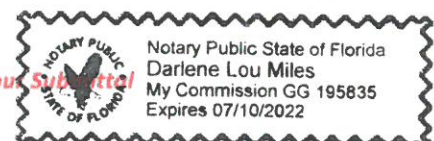
My Commission Expires: 07/10/2022

Darlene Lou Miles

Notary Public, State of Florida

Printed, typed or stamped name, commission and
expiration:

This document must be completed and returned with your Submittal



FORM 7.5 – SWORN STATEMENT UNDER SECTION 287.133(3)(A), FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

(To be signed in the presence of notary public or other officer authorized to administer oaths.)

Before me, the undersigned Authority, personally appeared affiant Hassan Saboungi, who, being by me first duly sworn, made the following statement:

1. The business address of Saboungi Construction, Inc. (name of Offeror or business) is 290A N US Highway 1, Ormond Beach, FL 32174.
2. My relationship to Saboungi Construction, Inc. (name of Offeror or business) is President (relationship such as sole proprietor, partner, president, vice president).
3. I understand that a public entity crime as defined in Section 287.133 of the Florida Statutes includes a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity in Florida or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any proposal or contract for goods or services to be provided to any public entity or such an agency or political subdivision and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.
4. I understand that "convicted" or "conviction" is defined by the Florida Statutes to mean a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilt or nolo contendere.
5. I understand that "affiliate" is defined by the Florida Statutes to mean (1) a predecessor or successor of a person or a corporation convicted of a public entity crime, or (2) an entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime, or (3) those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate, or (4) a person or corporation who knowingly entered into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months.
6. Neither the Offeror or contractor, nor any officer, director, executive, partner, shareholder, employee, member or agent who is active in the management of the Offeror or contractor, nor any affiliate of the Offeror or contractor has been convicted of a public entity crime subsequent to July 1, 1989. (Draw a line through paragraph 6 if paragraph 7 below applies.)
7. There has been a conviction of a public entity crime by the Offeror or contractor, or an officer, director, executive, partner, shareholder, employee, member or agent of the Offeror or contractor who is active in the management of the Offeror or contractor or an affiliate of the Offeror or contractor. A determination has been made pursuant to Section 287.133(3) by order of the Division of Administrative Hearings that it is not in the public interest for the name of the convicted person or affiliate to appear on the convicted bidder list. The name of the convicted person or affiliate is: _____ A copy of the order of the Division of Administrative Hearings is attached to this statement. (Draw a line through paragraph 7 if paragraph 6 above applies.)

Saboungi Construction, Inc.

Name of Business

By: Hassan Saboungi

Printed Name: Hassan Saboungi

Title: Vice President

STATE OF Florida

COUNTY OF Volusia

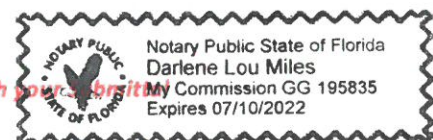
The foregoing instrument was acknowledged before me by means of X physical presence or _____ online notarization, this 19th day of April, 20 21 by Hassan Saboungi who is personally known to me or who produced _____ as identification.

My Commission Expires: 07/10/2022

Darlene Lou Miles

Notary Public, State of Florida

Printed, typed or stamped name, commission and expiration:



This document must be completed and returned with your signature.

FORM 7.6 – ANTI-COLLUSION FORM

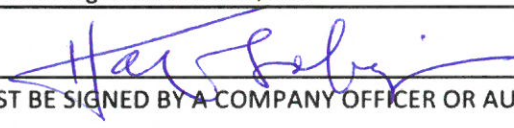
ANTI-COLLUSION STATEMENT BID FORM:

By signing this form, the Proposer agrees that this Bid is made without any other understanding, agreement, or connection with any person, corporation, or firm submitting a bid for the same purpose and that the bid is in all respects fair and without collusion or fraud.

SIGN in ink in the space provided below. Unsigned Bids will be considered incomplete, and will be disqualified, and rejected.

IT IS AGREED BY THE UNDERSIGNED BIDDER THAT THE SIGNING AND DELIVERY OF THE BID REPRESENTS THE BIDDERS ACCEPTANCE OF THE TERMS AND CONDITIONS OF THE FOREGOING SPECIFICATIONS, CONTRACT AND PROVISIONS, AND IF AWARDED, THIS CONTRACT WILL REPRESENT THE AGREEMENT BETWEEN THE BIDDERS AND THE CITY OF PORT ORANGE.

NAME OF FIRM: Saboungi Construction, Inc.

SIGNED BY: 
(MUST BE SIGNED BY A COMPANY OFFICER OR AUTHORIZED AGENT)

PRINTED SIGNATURE: Hassan Saboungi

TITLE: Vice President

ADDRESS: 290A N US Highway 1

Ormond Beach

CITY: Ormond Beach STATE: Florida ZIP CODE: 32174

(386) 672-2077

TELEPHONE: (386) 672-2077 FAX: (386) 673-4189

COMPLETION TIME: _____

F.E.I.N. NUMBER: 59 - 2219055

NO Bid may be withdrawn for a period of ninety (90) days subsequent to the submittal of the Bids, without the consent of the City of Port Orange.

NO BID (REASON): _____

This document must be completed and returned with your Submittal

FORM 7.7 – STATEMENT OF BIDDER'S QUALIFICATIONS

The undersigned warrants that he or she is duly authorized to complete this document, and hereby affirms that the information contained in Form 7.8 is complete, true, and correct to the best of their knowledge and belief. If necessary, questions may be answered on separate paper and attached, with any additional information that may be pertinent.

- A. Name of Bidder.
- B. Permanent main office address.
- C. Date organized.
- D. If a corporation, where incorporated.
- E. How many years have you been engaged in the contracting business under your present firm or trade name?
- F. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion.)
- G. General character of work performed by your company.
- H. Have you ever failed to complete any work awarded to you? If so, where and why?
- I. Have you ever defaulted on a contract? If so, where and why?
- J. List the more important projects recently completed by your company, stating the approximate cost for each and the month and year completed.
- K. List your major equipment currently owned or leased.
- L. Experience in work similar to this type of project.
- M. Background and experience of the principal members of your organization, including the officers.
- N. Credit currently available: \$ _____
- O. Give bank reference: _____
- P. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the Owner?
- Q. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of Bidder's Qualifications.

Saboungi Construction, Inc.

Name of Business

By: Hassan Saboungi

Printed Name: Hassan Saboungi

Title: Vice President

STATE OF Florida

COUNTY OF Volusia

The foregoing instrument was acknowledged before me by means of X physical presence or
_____ online notarization, this 19th day of April, 20 21 by Hassan Saboungi who
is personally known to me or who produced _____ as identification.

My Commission Expires: 07/10/2022

Darlene Lou Miles
Notary Public, State of Florida
Printed, typed or stamped name, commission number
expiration: My Commission CG 195835
Expires 07/10/2022

This document must be completed and returned with your Submittal

M. "Mike" Saboungi
President



Hassan Saboungi
Vice President

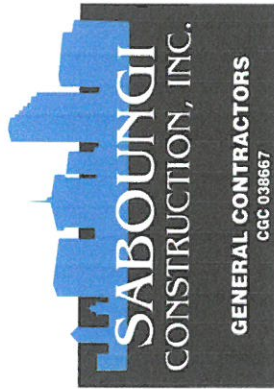
290 A North U.S. Highway 1, Ormond Beach, FL 32174-4504
Tel: (386) 672-2077 Fax: (386) 673-4189
www.saboungiconstruction.com

FORM 7.7 – STATEMENT OF BIDDER'S QUALIFICATIONS

- A. Saboungi Construction, Inc.
- B. Permanent address is 290A North U.S. Hwy 1, Ormond Beach, FL 32174
- C. Organized in June 1982
- D. Incorporated in the State of Florida
- E. Engaged in the contracting business for 39 years
- F. Please see the attached list of Contracts on Hand
- G. We perform all commercial construction consisting of renovations, additions, new construction, site work, etc., for both the public and private sectors
- H. Saboungi Construction has never failed to complete any work awarded
- I. Saboungi Construction has never defaulted on a contract
- J. Please see the attached list of Completed Projects
- K. We own a water tanker, a dump trailer, generators, compressors, lasers and hand tools. We lease larger equipment as needed from Synergy, United, etc.
- L. Please see the attached list of Completed Projects. Our company completed the Original Expansion and Renovation to the Port Orange Recreation Building in 1989.
- M. Please see the attached Resumes of Hassan Saboungi and Mike Saboungi
- N. Credit available is \$100,000
- O. Suntrust Bank
- P. Saboungi Construction is willing to provide a detailed financial statement and furnish other information, upon request.

290 North U.S. Highway 1, Suite A
Ormond Beach, FL 32174-4504

Tel (386) 672-2077
Fax (386) 673-4189



M. "Mike" Saboungi
President

Hassan Saboungi
Vice President

CONSTRUCTION PROJECTS IN PROGRESS

Name of Project	Amount	Estimated Completion Date	Design Architect or Engineer		Owner		References
			Address & Phone		Address & Phone		
Fire Station #32 Parking Lot	\$29,952	4/21	Zev Cohen & Assoc. Inc. 300 Interchange Blvd., Suite C Ormond Beach FL 32174 Randy Hudak 386-677-2482		County of Volusia 123 W Indiana Ave DeLand FL 32720 386-736-5967		
Ponce Preserve Boardwalk Repair Ponce Inlet, FL	\$40,000	4/21	N/A		Town of Ponce Inlet 4300 S Atlantic Ave Ponce Inlet, FL 32127 Jeff Miller, Public Works Director 386-236-2150		
Lemon Bluff Marine Park 949 Lemon Bluff Rd. Osteen, FL 32764	\$1,811,258	4/21	DMC Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 386-304-6505 www.dmcscs.com		County of Volusia 123 W Indiana Ave DeLand FL 32720 386-804-7403 Charles Conway cconway@volusia.org		

Name of Project	Amount	Estimated		Owner	References
		Completion Date	Design Architect or Engineer Address & Phone		
Sperling Sports Complex Field Improvements & Restroom/Concession Building	\$674,265	4/21	CPH Engineers Inc 500 W Fulton St. Sanford, FL 32771 407-322-6841 Jason Kellogg, P.E.	City of Deland 120 S Florida Ave. DeLand FL 32121-0449 386-626-7197 Mr. Keith Riger, P.E.	Mr. Keith Riger, P.E. Public Services Director
Dune Crossover Daytona Beach Shores	\$36,500	5/21	N/A	Mr. John Volchko 1099 Walnut Woods Place Lake Mary, FL 32746	
Plaza Blvd. Phase I	\$566,648	5/21	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 Ankeet Rama 386-304-6505	County of Volusia 123 W Indiana Ave DeLand FL 32724 Mr. Niles Cyzycki 386-248-8072 X20357	
Plaza Blvd. Phase II	\$228,178		Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 Ankeet Rama 386-304-6505	County of Volusia 123 W Indiana Ave DeLand FL 32724 Mr. Niles Cyzycki 386-248-8072 X20357	
18 th Ave Pedestrian Beach Access Structure	\$253,160	6/21	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 Ankeet Rama 386-304-6505	County of Volusia 515 S Atlantic Ave Daytona Beach FL 32118 Mr. Niles Cyzycki 386-248-8072 X20357 ncyzycki@volusia.org	
Halifax Health Pediatrics Renovation	\$1,128,810	8/21	Studio W Architecture 1147 Brittsdale Ct Apopka FL 32712 Valerie Ward	Halifax Health Medical Center 303 N Clyde Morris Blvd. Daytona Beach FL 32114 John Lavin 386-425-4000	

Name of Project	Amount	Estimated		Design Architect or Engineer	Owner	References
		Completion Date	Address & Phone			
ICDB Derbyshire Buiding 825 Derbyshire Rd Daytona Beach, FL 32117	\$1,988,400	10/21	BFY Associates Inc. 645 N. Halifax Ave. Daytona Beach FL 32118 386-405-3152 Roman Yurkiewicz, Arch., Pres. BFY@aol.com	Islamic Center of Daytona Beach Inc 347 S Keech St Daytona Beach FL 32114 386-401-9353 Mr. Khalid Resheidat Nhffmkr@gmail.com		

290 North U.S. Highway 1, Suite A
Ormond Beach, FL 32174-4504

Tel (386) 672-2077
Fax (386) 673-4189



M. "Mike" Saboungi
President

Hassan Saboungi
Vice President

SOME CONTRACTS COMPLETED IN THE PAST SEVERAL YEARS BY OUR FIRM...

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
One Caring Family ALF 3130 Opportunity Court South Daytona FL 32119	\$1,814,139	07/20	BFY Associates Inc. Roman Yurkiewicz, Arch., Pres. 645 N. Halifax Ave. Daytona Beach FL 32118 386-405-3152 BFY@aol.com	Regina Ashihene, M.D., LLC Regina Ashihene 5856 Boggsford Rd. Port Orange FL 32127 386-451-6871 riasihene@gmail.com	
Bay Drive Park Bay Drive off A1A Palm Coast, Flagler Co., FL	\$723,250	4/20	DJ Design Services, Inc. 913 North Nova Road Holly Hill, FL 32117 (386) 255-6987 Mr. Jim Wachtel	Flagler County 1769 E Moody Blvd., Bldg. 2 Bunnell FL 32110 386-313-4001 Amy Kennedy Stroger	
Pollard Park Improvements 4680 S Peninsula Dr Ponce Inlet FL 32127	\$820,262	04/20	Mead & Hunt 4401 Eastport Parkway Port Orange FL 32127 386-761-6810 Andrew Giannini, PE portorangebids@meadhunt.com	Town of Ponce Inlet 4300 S Atlantic Ave Ponce Inlet FL 32127 386-236-2180 Ms. Peg Hunt phunt@ponce-inlet.org	

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
Holland Park Phase II Palm Coast, FL Masonry	\$21,200	3/20	Joseph Pozzuoli, Architect 314 Moody Blvd. Flagler Beach FL 32136 386-439-5650 Mr. Joseph Pozzuoli	BBI Const. Mgmt Inc 4639 NW 53 rd Ave. Gainesville FL 32653 352-338-2073 Mr. Luke Burge	
Halifax Harbor Marina Seawall Restoration 450 Basin St. Daytona Beach, FL 32114	\$334,757	01/20	DRMP 941 Lake Baldwin Lane Orlando FL 32814 407-896-0594	City of Daytona Beach PO Box 2451 Daytona Beach 32115-2451 386-671-8613 Jim Nelson	
Ocean Center Parking Garage Elevator Vestibule Replacement	\$55,400	12/19	DJ Design Inc 913 N Nova Rd. Holly Hill, FL 386-255-6987 Mr. Jim Wachtel	County of Volusia 123 W Indiana Ave DeLand FL 32724 386-736-5920 Shaira D Resto, MBA, CPPB sresto@volusia.org	
Off Beach Parking 650 S Atlantic Ave. Ormond Beach, FL Lifeguard Maintenance Facility & Public Parking	\$1,950,708	10/19	DJ Design Inc 913 N Nova Rd. Holly Hill, FL Mr. Jim Wachtel 386-255-6987	County of Volusia 123 W Indiana Ave DeLand FL 32724 Mr. Niles Cyzycki 386-736-5920	
Hemaidan Williamson Building 4015 S Williamson Blvd. Port Orange FL 32129	\$60,000	09/19	BFY Associates Inc. 645 N. Halifax Ave. Daytona Beach FL 32118 386-405-3152 Roman Yurkiewicz, Arch., Pres BFY@aol.com	Rainbow Development Gp LLC 1690 Dunlawton Ave, Ste. 510 Port Orange FL 32127-8980 Dr. Amar Hemaidan	
27 th Ave Beachfront Park Site & Drainage Improvements 3701 S A1A New Smyrna Beach FL 32168	\$160,400	07/19	Parker Mynchenberg & Assoc Inc 1729 Ridgewood Ave Holly Hill FL 32117 386-677-6891	City of New Smyrna Beach 210 Sams Ave New Smyrna Beach FL 32168 386-424-2209 Kyle Fegley P.E. Kfegley@cityofnsb.com	

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
Bethune Point Park Observation Pier Repair	\$94,842	05/19	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 386-304-6505 Mr. Stephen J Kuhn	City of Daytona Beach PO Box 2451 Daytona Beach FL 32115-2451 386-671-8613 Mr. Jim Nelson	
Swoope Boat Ramp Phase 2 Improvements New Smyrna Beach, FL	\$635,611	4/19	Quentin L Hampton Assoc. 4401 Eastport Parkway Port Orange FL 32127 Andrew Giannini, P.E. 386-414-5052 andrew.giannini@meadhunt.com	City of New Smyrna Beach 210 Sams Ave. New Smyrna Beach FL 32168 Kyle Fegley, P.E. 386-424-2209 Kfegley@cityofnsb.com	
Hope Place Library Services Facility Part B Const. Mgmt GMP Daytona Beach, FL	\$900,000	4/19	Hall & Ogle, Arch. 208 Magnolia Ave. Daytona Beach FL 32114 Mr. David Ogle 386-255-6163 dogle@hoarchitects.com	County of Volusia 123 W Indiana Ave DeLand, FL 32720 Mr. Gary Morton 386-626-6623 GMorton@volusia.org	
Modad Patricia Medical Office Palm Coast, FL	\$98,864.00	4/19	BFY Associates Inc. Roman Yurkiewicz, Arch., Pres 645 N. Halifax Ave. Daytona Beach FL 32118 386-405-3152 BFY@aol.com	Patricia Modad, M.D. Palm Coast OBGYN Inc 50 Leanni Way, Suites A3, A4 Palm Coast FL 32137	
Riverside Park Gazebo Replacement New Smyrna Beach, FL	\$31,247	11/18	City of New Smyrna Beach 210 Sams Ave New Smyrna Beach FL 32168 Michelle Vallance 386-410-2613 mvallance@cityofnsb.com	City of New Smyrna Beach 210 Sams Ave. New Smyrna Beach FL 32168 Michelle Vallance 386-410-2613 mvallance@cityofnsb.com	
Public Safety Docking Facility At Vilano Boat Ramp St. Augustine, FL	\$508,400	10/18	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129	St. Johns County 500 San Sebastian View St. Augustine FL 32084	Mr. Shailesh Patel, P.E. 386-304-6505 spatel@dmces.com

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
			Mr. Shailesh Patel 386-304-6505 spatel@dmcees.com	Jaime Locklear, Asst P.M. 904-209-0158	
Hammock Dunes Walkovers	\$739,200	06/18	Stephenson, Wilcox & Assoc. Inc. 204 N Railroad St. Bunnell, FL 32110 Mr. Dan A Wilcox, P.E. 386-407-2363	Hammock Dunes Owners Assn Inc PO Box 353338 Palm Coast FL 32135 Mr. Travis Houck 863-698-2190	
Dune Walkover Restoration Daytona Beach Shores	\$348,010	05/18	Hall & Ogle, Arch. 208 Magnolia Ave. Daytona Beach FL 32114 Mr. David Ogle 386-255-6163 dogle@hoarchitects.com	City of Daytona Beach Shores 2990 S Atlantic Ave. Daytona Beach Shores FL 32118 Mr. Fred Hiatt 386-763-5353	
Dune Walkover Reconstruction Group 1	200,960	04/18	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 Mr. Shailesh Patel 386-304-6505 spatel@dmcees.com	County of Volusia 123 W Indiana Ave DeLand, FL 32720 Mr. Gary Morton 386-626-6623 GMorton@volusia.org	
Public Works Restoration South Daytona, FL	39,680	02/18	City of South Daytona	City of South Daytona PO Box 214960 South Daytona FL 32121-4960 Mr. Les Gillis, P.E. Deputy City Manager Public Works Director 386-322-3080 lgillis@southdaytona.org	
Restrooms at pcnaf & itisc	930,200	12/17	Marquis Latimer + Halback, Inc. 34 Cordova Street, Suite A St. Augustine FL 32084 PM: Jeremy Marquis 386-986-3780 904-825-6747	City of Palm Coast 160 Lake Ave. Palm Coast, FL 32164 Mr. Carl Cote 386-986-3780 386-986-3748	

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
YMCA Design Build ADA Bathroom Addition	124,800	12/17	BFY Associates Inc. Roman Yurkiewicz, Arch., Pres. 645 N. Halifax Ave. Daytona Beach FL 32118 © 386-405-3152	City of Edgewater Robin Matusick, City Clerk PO Box 100 Edgewater, FL 32132-0100 386-424-2400 X 1101	
Riverwalk Park Phase 1B 3441 Ridgewood Ave. Port Orange FL 32129 Large Public Park with Splash Pad & Amenities	3,605,400	10/17	Dredging & Marine Consultants 4643 S Clyde Morris Blvd #302 Port Orange FL 32129 Mr. Stephen Kuhn, P.E. 386-304-6505 SKuhn@dmces.com	City of Port Orange 1000 City Center Circle Port Orange, FL 32129 Ms. Susan Lovallo 386-506-5852 slovallo@port-orange.org	
New Pavilion at Mary Ave. Tot Lot	23,300	8/17	N/A	City of New Smyrna Beach 210 Saws Ave. New Smyrna Beach FL 32168 Ms. Donna Park 386-314-4849 dbanks@CityOfNSB.com	
Lotus Inn Elevator Bldg.	44,950	7/17	MS Structural Engineers John Simco 386-672-1214	Lotus Inn Motel 505 S. Atlantic Ave. Ormond Beach FL 32176 Mr. Kinit Patel 386-214-0434	
Off-Beach Parking at 880 N Atlantic Ave. Daytona Beach, FL	734,635	7/17	Hall & Ogle Arch. Inc. 208 Magnolia Ave. Daytona Beach FL 32114 Mr. David Ogle 386-255-6163 dogle@hoarchitects.com Parker Mychenberg & Assoc. 386-677-6891	County of Volusia 123 W Indiana Ave. DeLand, FL 32720 Inga Fegley, CPPB 386-626-6623 ifegley@volusia.org Gary Morton GMorton@volusia.org	
Spring Gardens Heights ADA Sidewalk DeLand, FL	76,600	1/17	Volusia County VC Road & Bridge 2560 SR 44 DeLand, FL	County of Volusia 123 W Indiana Ave DeLand, FL 32720 Tom Morrissey	

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
			Tom Morrissey 386-822-6422 tmorrissey@volusia.org	386-626-6623	
Daytona Helmets 1810 Mason Ave. Daytona Beach, FL 32117 Office, Warehouse & Distribution, 25,720 sf	2,159,483	12/16	BFY Associates Inc. 203 Glenview Blvd. Daytona Beach, FL 32118 Mr. Roman Yurkiewicz, R.A. 386-258-2261	The L Squared, LLLP 4929 N Waterbridge Circle Port Orange, FL 32129 Mr. Joey Linge 386-871-8061	
Holsonback Sidewalk Project	103,408	12/16	City of Daytona Beach 301 S Ridgewood, Rm 146 Daytona Beach FL 32114 Michelle Martin, P.M. Public Works Division martinm@codb.us	City of Daytona Beach 301 S Ridgewood, Rm 146 Daytona Beach FL 32114 Michelle Martin, P.M. Public Works Division martinm@codb.us	
Restoration of the Historic Daytona Beach Bandshell	460,088	10/16	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	
Midtown Auxiliary Building 925 George Ingram Blvd.	124,020	10/16	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	
Votran Super Stop Julia St. New Smyrna Beach, FL	319,273	10/16	Parker Mynchenberg & Associates Inc 1729 Ridgewood Ave. Holly Hill FL 32117	County of Volusia 123 W Indiana Ave., Room 302 DeLand FL 32720-4608 Mr. Gary Morton, Const. Mgr. gmorton@volusia.org	
Restoration of the Historic Daytona Beach Clock Tower	236,016	6/16	City of Daytona Beach 950 Bellevue Ave	City of Daytona Beach 950 Bellevue Ave.	

Name of Project	Amount	Completion Date	Design Architect or Engineer Address & Phone	Owner Address & Phone	References
50 Boardwalk			Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	Daytona Beach FL 32117 Mr. Rick Doyle 386-671-8608 DoyleR@CODB.US	
Utilities Storage Building West Volusia Transfer Station DeLand, FL	416,710	06/16	Neel-Schaffer, Inc. 2301 Lucien Way, Ste. 300 Maitland FL 32751 Mr. Ron S Beladi, PM ron.beladi@neel-schaffer.com	County of Volusia 123 W Indiana Ave., Room 302 DeLand FL 32720-4608 Mr. Scott Mays, P.E., P.M. smays@volusia.org	
Halifax River Greenway Trail 101 N Beach St. Daytona Beach FL 32117	316,845	05/16	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Jim Nelson, P.E. City Engineer 386-671-8613 NelsonJ@CODB.US	City of Daytona Beach 950 Bellevue Ave. Daytona Beach FL 32117 Mr. Jim Nelson, P.E. City Engineer 386-671-8613 NelsonJ@CODB.US	

HASSAN SABOUNGI



Vice President / Treasurer
Senior Project Manager / Senior Estimator
Certified General Contractor 1986
State of Florida License Number CGC 038667
Certified Renovator in 2010
U.S. Environmental Protection Agency
Bachelor of Science Business Administration 1982
University of Central Florida

Phone 386-672-2077

Fax 386-673-4189

Email Hassan@saboungiconstruction.com

Cell 386-547-4714

Hassan Saboungi has experience in the construction industry since 1982, all of which have been with **Saboungi Construction Inc.** since he co-founded it. Hassan Saboungi has had a major role in the project management and administration of 180+ contracts. He has been a senior construction manager for over 100 private and public contracts. He has performed the services of senior estimator, contract negotiation, pre-construction & value engineering, project management in addition to design-build construction contracts. His additional duties include risk management and financial oversight of **Saboungi Construction, Inc.** plus other business interests.

Schools

New Cunningham Creek Elementary School for St Johns County, Additions & Renovations projects at Ormond Beach Middle, Osceola Elementary, DeLand High, Chisholm Elementary, Campbell Middle, Holly Hill Middle, Southwestern Middle and Over 20+ projects for the Volusia County School Board.

Public Safety

Deland Fire Station West, Ormond Beach Fire Station 93, Ormond Beach Fire Station 91 Renovations

Commercial

Nova Fountain Business Park, Twin Fountains Business Center, Longwood Self Storage, All Aboard Storage, Bravo Supermarket, Daytona Helmets.

RESUME

Health and Medical Services

Majestic Springs Assisted Living Facility, Gentle Dental, Eagle Eye Dental, Advanced Healthcare Center, Advanced Gastroenterology, Volusia OB/GYN, Volusia Internal Medicine Specialists, Atlantic Veterinary Hospital, Tomoka Medical Lab, LabCorp, Children's Medical Center.

Site Utility and Infrastructure

Woodland Boulevard Main Street Deland Streetscape, Granada Boulevard Ormond Beach Streetscape, New Smyrna Beach Industrial Park, Sidewalks and Public safety projects thru out Volusia County

Parks and Recreation

Port Orange Riverwalk Park, Ormond Beach Andy Romana Beachfront Park. Boardwalk Park & Bandshell Improvements, *Port Orange Gymnasium Addition and Renovation*, *Port Orange Amphitheater Roof*, *Port Orange YMCA Additions and Renovations*, *Spruce Creek Park Improvements*, Bethune Point Park, Ormond Beach Gymnastics Building.

Historical Renovations

Daytona Beach Historic Bandshell Exterior Restoration, Clocktower Historic Restoration, MacDonald House, Ames House, Fire Station No. 91.

Multi-Family

River Oaks Condominium, Multiple U. S. Housing and Urban Development Modernization projects.

Worship

Islamic Center of Daytona Beach, Muslim Cemetery of Volusia County.

This is only a partial list of the numerous projects Hassan Saboungi completed with **Saboungi Construction, Inc.**



M. "MIKE" SABOUNGI

President

Senior Project Manager / Senior Estimator

Certified General Contractor 1979

State of Florida License Number CGC 013521

Bachelor of Science in Applied Science 1952

Universite De Lyon in Beirut, Lebanon

Masters in Civil Engineering 1954

Universite De Lyon in Beirut, Lebanon

Phone 386-672-2077

Fax 386-673-4189

Email Mike@saboungiconstruction.com

Cell 386-547-4715

Mike Saboungi practiced civil engineering from 1954 to 1962.

In 1962, he began a contracting business building airports, municipal buildings and highrise condominiums. In 1977, he moved to Florida where upon he acquired his Florida GC license. After working as a sole proprietor, he co-founded **Saboungi Construction, Inc.** in 1982. His vast experience in engineering and construction from 1954 to the present allows him to excel at all challenges. Mike Saboungi has had a major role in the project management and administration of 180+ contracts. He has performed the duties of senior estimator, contract negotiation, pre-construction & value engineering and project management.

Schools

Various Additions & Renovations projects at Seabreeze High, T.D. Taylor High, New Smyrna Beach High, Starke Elementary, Osceola Elementary, Pine Trail Elementary, Ormond Beach Elementary, Spruce Creek Elementary and over 20+ projects for the Volusia County School Board.

Public Safety

Flagler Beach Police Station, Volusia County Sheriff Communication Center, Volusia County Sheriff Shooting Range.

Post Offices

Ormond Post Main Office, Palm Coast Main Post Office, Port Orange Post Office fuel station Addition.

RESUME

Parks and Recreation

Marine Science Center Phase I and Phase II, Indian Lakes Sports Complex, Belle Terre Park, Ralph Carter Park, Seminole Woods Park, Matanzas & Marineland Park, Indian River lagoon Park, South Ormond Recreation Center just to name a few.

Site Utility and Infrastructure

Ormond Beach water treatment plant renovations and miles of sidewalk projects for most of the local municipalities.

Health and Medical Services

Flagler County Health Department Center, Turtle Creek Medical Center, LeCompte Orthodontics, Dr. Souheil Moussly Medical Office.

Commercial

Anything Goes Gift Shop, Nationwide Insurance, Speedway Gas Stations, Discount Auto Parts.

Historical Renovations

Tarragona Arch Renovations, Dr. Josie Rogers House, Excelsior Service Center HRS Headquarters for St. Johns County.

Worship

Islamic Center of Daytona Beach, Muslim Cemetery of Volusia County.

This is only a partial list of the numerous projects Mike Saboungi completed with **Saboungi Construction, Inc.**

FORM 7.8 – PROFESSIONAL REFERENCES FOR PREVIOUS EXPERIENCE

The Bidder proposes that they are qualified to perform the referenced work and has successfully done so on recent projects similar in nature and size. The City reserves the right to check references and confirm information provided herein.

Please provide three (3) current and correct references from clients for similar services.

(Do not include the City of Port Orange)

1. Company Name: County of Volusia
Contact Person: Niles Cyzycki
City, State: 650 S. Atlantic Ave., Ormond Beach, FL
Telephone Number: (386) 248-8072 x20357
Email Address: ncyzycki@volusia.org
Description of goods or
Services provided: Off Beach
Contract Amount: \$ 1,950,708
Start/End Date of Contract: Completed October 2019
2. Company Name: City of New Smyrna Beach
Contact Person: Michelle Vallance
City, State: 201 N. Myrtle Ave., New Smyrna Beach
Telephone Number: 386-410-2613 or 386-402-6109
Email Address: mvallance@cityofnsb.com
Description of goods or
Services provided: Babe James Splash Park
Contract Amount: \$ 520,986.
Start/End Date of Contract: Completed October 2020
3. Company Name: Town Manager Town of Ponce Inlet
Contact Person: Mrs. Jeaneen Witt
City, State: 4300 S. Atlantic Ave., Ponce Inlet, Florida 32127
Telephone Number: 386-236-2150
Email Address: jwitt@ponce-inlet.org
Description of goods or
Services provided: Pollard Park Improvements
Contract Amount: \$ 820,262
Start/End Date of Contract: Completed April 2020

This document must be completed and returned with your Submittal.

FORM 7.8 – PROFESSIONAL REFERENCES FOR PREVIOUS EXPERIENCE

The Bidder proposes that they are qualified to perform the referenced work and has successfully done so on recent projects similar in nature and size. The City reserves the right to check references and confirm information provided herein.

Please provide three (3) current and correct references from clients for similar services.

(Do not include the City of Port Orange)

1. Company Name: Majestic Gardens Assisted Living Facility
Contact Person: Regina Asihene
City, State: 3130 Opportunity Court, South Daytona, FL
Telephone Number: 386-562-6871
Email Address: rjasihene@gmail.com
Description of goods or
Services provided: Majestic Gardens Assisted Living Facility
Contract Amount: \$1,814,814
Start/End Date of Contract: Completed May, 2020
2. Company Name: The L Squaired LLLP
Contact Person: Joey Linge
City, State: 1810 Mason Road, Daytona Beach, FL 32117
Telephone Number: 386-871-8061
Email Address: joey@daytonahelmets.com
Description of goods or
Services provided: Daytona Helmets Corporate Facility
Contract Amount: 2,359,483
Start/End Date of Contract: Completed December, 2016
3. Company Name: Rainbow Development Group LLC
Contact Person: Ammar Hemaidan
City, State: Port Orange, Florida
Telephone Number: 386-795-4324
Email Address: AHemaidan@gmail.com
Description of goods or
Services provided: Madeline & Williamson Property Improvements
Contract Amount: 636,892
Start/End Date of Contract: Completed June, 2020

This document must be completed and returned with your Submittal.

LISTING OF PREVIOUS EXPERIENCE

Commercial Client List

The Bidder proposes that they are qualified to perform the referenced work and has successfully done so on recent projects similar in nature and size. A minimum of three (3) projects must be listed below. The Owner reserves the right to check references and confirm information provided herein.

List clients to whom you currently provide or have in the past provided equal or similar to those required under the City's contract and as outlined in this bid package. A minimum of three (3) projects shall be listed below in order to bid on this contract. The Owner reserves the right to check references and confirm information provided herein.

	Contact Name	Phone	Current Client? Y or N	Number of years service provided	Description of service
1	See Attached List Under 7.7				
2					
3					

This document must be completed and returned with your Submittal.

FORM 7.9 – LISTING OF SUBCONTRACTORS

The Bidder proposes that the following subcontractors are qualified to perform the referenced work and have successfully done so on recent projects similar in nature and size. All subcontractors as referenced in Specifications Section 013300-2.1, I (1) shall be listed. Upon approval of subcontractors listed, the successful **Bidder shall not substitute subcontractors without approval from the City.** Bidder shall attach additional sheets as necessary.

Subcontractor No. 1

Name: Local Electric Services, LLC

Description of Work: Electrical / F.A. / Lightning Protection

Percent of Contract Price: 11.5 %

Previous Experience Together: Yes/No No

Subcontractor No. 2

Name: Advance Mechanical Systems, Inc.

Description of Work: HVAC

Percent of Contract Price: 5.8%

Previous Experience Together: Yes/No No

Subcontractor No. 3

Name: G&W Welborn Plumbing, LLC

Description of Work: Plumbing

Percent of Contract Price: 5.2%

Previous Experience Together: Yes/No Yes

Subcontractor No. 4

Name: AWS Roofing

Description of Work: Roofing

Percent of Contract Price: 6.4%

Previous Experience Together: Yes/No Yes

Subcontractor No. 5

Name: Colson Corp

Description of Work: Acoustical Ceiling

Percent of Contract Price: 1%

Previous Experience Together: Yes/No Yes

This document must be completed and returned with your Submittal

FORM 7.9 – LISTING OF SUBCONTRACTORS

The Bidder proposes that the following subcontractors are qualified to perform the referenced work and have successfully done so on recent projects similar in nature and size. All subcontractors as referenced in Specifications Section 013300-2.1, I (1) shall be listed. Upon approval of subcontractors listed, the successful **Bidder shall not substitute subcontractors without approval from the City.** Bidder shall attach additional sheets as necessary.

Subcontractor No. 1

Name: Hogan Glass Corp

Description of Work: Aluminum Storefronts

Percent of Contract Price: 2.6%

Previous Experience Together: Yes/No Yes

Subcontractor No. 2

Name: Ocean Flooring Co.

Description of Work: Flooring & Tile

Percent of Contract Price: 1.5%

Previous Experience Together: Yes/No Yes

Subcontractor No. 3

Name: Marcos' Custom Cabinetry

Description of Work: Millwork

Percent of Contract Price: .7%

Previous Experience Together: Yes/No No

Subcontractor No. 4

Name: Big Value Garden Center

Description of Work: Landscape / Irrigation

Percent of Contract Price: .7%

Previous Experience Together: Yes/No Yes

Subcontractor No. 5

Name: GMS Green Mountain Specialties

Description of Work: Structural Steel

Percent of Contract Price: 11.2%

Previous Experience Together: Yes/No Yes

This document must be completed and returned with your Submittal

FORM 7.9 – LISTING OF SUBCONTRACTORS

The Bidder proposes that the following subcontractors are qualified to perform the referenced work and have successfully done so on recent projects similar in nature and size. All subcontractors as referenced in Specifications Section 013300-2.1, I (1) shall be listed. Upon approval of subcontractors listed, the successful **Bidder shall not substitute subcontractors without approval from the City**. Bidder shall attach additional sheets as necessary.

Subcontractor No. 1

Name: Samsula Demolition

Description of Work: Selective Demolition

Percent of Contract Price: .8%

Previous Experience Together: Yes/No Yes

Subcontractor No. 2

Name: Saboungi Construction, Inc.

Description of Work: Metal Stud Framing & Drywall / Painting/ Concrete Placement / Rough Carpentry

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

Subcontractor No. 3

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

Subcontractor No. 4

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

Subcontractor No. 5

Name: _____

Description of Work: _____

Percent of Contract Price: _____

Previous Experience Together: Yes/No _____

This document must be completed and returned with your Submittal

FORM 7.10 – CERTIFICATE AS TO CORPORATE PRINCIPAL

I, Maisha Saboungi, certify that I am the Saboungi Construction, Inc. secretary of the corporation named as Principal in the within Bid Bond; that Hassan Saboungi Vice President, who signed the said Bid Bond on behalf of the Principal, was then of said corporation; that I know his signature, and his signature thereto is genuine; and that said Bid Bond was duly signed, sealed and attested for in behalf of said corporation by authority of its governing body.


Signature

AFFIX CORPORATE SEAL

This document must be completed and returned with your Submittal

FORM 7.11 - LOCAL BUSINESS AFFIDAVIT OF ELIGIBILITY

City of Port Orange

*This declaration is executed under penalty of perjury of the laws to the United States and State of Florida***THIS AFFIDAVIT IS SUBMITTED IN REFERENCE TO THE FOLLOWING SOLICITATION:**RFSQ/RFP/ITN/BID/CONTRACT/PROJECT #(as applicable): ITB #21-13BUSINESS NAME: Saboungi Construction, Inc. CONTACT PERSON/TITLE: Vice President MAILING ADDRESS: 290A N US Highway 1,CITY-STATE-ZIP: Ormond Beach, FL 32174 Length of Time at Address Provided: 39 YearsPhysical Presence of Business: ☒ Headquarters, ☐ Manufacturing Facility, or ☐ Locally Owned FranchiseAnd within Legal Boundaries: ☐ The City of Port Orange ☒ Volusia County ☐ The State of

Florida FEIN (Federal Employer Identification Number): _____

BUSINESS STRUCTURE: ☒ Corporation ☐ LLC ☐ Partnership ☐ Sole Proprietorship
☐ Other (Specify): _____PHONE NUMBER: (386) 672-2077 FAX: (386) 673-4189EMAIL: info@saboungiconstruction.com****Please attach a valid business tax receipt, or other such documentation******ATTESTATION – I understand that:**

- In accordance with City Of Port Orange City Code 2-275, local businesses shall have five (5) business days from bid/proposal opening to submit a best and final bid for evaluation. To qualify: A Port Orange business initial bid must be within (8%) of the lowest and best responsible bid from a non-Port Orange business; A Volusia County business initial bid must be within (5%) of the lowest and best responsible bid from a non-Volusia County business; A State of Florida business initial bid must be within (3%) of the lowest and best responsible bid from a non-State of Florida business.
- A local business must have its headquarters, manufacturing facility, or locally owned franchise located within the legal boundaries of the City of Port Orange, Volusia County, or the State of Florida, as indicated herein, for at least twelve (12) months prior to the bid or proposal opening date and a valid business license, issued by the corresponding government agency. Post office boxes are not verifiable and shall not be used for the purpose of establishing said physical address. Bidders shall attach to this affidavit of eligibility with a bid or proposal, a copy of a valid business tax receipt or such other documentation, to the city's satisfaction, demonstrating the physical business presence of the firm within corresponding local limits.
- The preference does not apply to goods or services exempted by statute or prohibited by Federal law, State law, or other funding source restrictions.
- The preference established in this policy does not prohibit the right of the City, or other authorized purchasing authority, to compare quality or fitness for use of supplies, materials, equipment and services proposed for purchase and compare qualifications, character, responsibility and fitness of all persons, firms or corporations submitting bids or proposals.
- The information contained herein may be subject to verification.
- A bidder who misrepresents the local preference status of its firm in a proposal or bid submitted to the City of Port Orange will lose the privilege to claim local preference status, and shall lose eligibility to claim local preference for a period of one (1) year. The City Manager may also recommend that the firm be referred for debarment.

As an authorized representative of the firm, I certify that this firm complies fully with the above requirements.

Saboungi Construction, Inc.

Name of Business

By: Hassan SaboungiPrinted Name: Hassan SaboungiTitle: Vice PresidentSTATE OF FloridaCOUNTY OF Volusia

The foregoing instrument was acknowledged before me by means of X physical presence or _____ online notarization, this 19th day of April, 20 , by Hassan Saboungi, as Vice President of Saboungi Construction, Inc., a _____, He or she is X personally known or _____ produced _____ as identification.

Darlene Lou Miles
Notary Public, State of Florida

Printed, typed or stamped name, commission and expiration



2020/ 2021

Volusia County Business Tax Receipt

Issued pursuant to F.S. 205 and Volusia County Code of Ordinances Chapter 114-1 by:
Volusia County Revenue Division - 123 W Indiana Ave, Room 103, DeLand, FL 32720 – (386) 736-5938



Account # 199205280003 Expires: September 30, 2021
Business Location: 290 N US HWY 1

Business Name: SABOUNGI CONSTRUCTION
Owner Name: HASSAN SABOUNGI
Mailing Address: 290 N US HWY 1 STE A
ORMOND BEACH, FL 32174

BUSINESS TYPE	REQ DOC #	CODE	COUNT	TAX
General Contractor Class A	CGC038667	301C	5	\$18.00

- This receipt indicates payment of a tax, which is levied for the privilege of doing the type(s) of business listed above within Volusia County. This receipt is non-regulatory in nature and is not meant to be a certification of the holder's ability to perform the service for which he is registered. This receipt also does not indicate that the business is legal or that it is in compliance with State or local laws and regulations.
- The business must meet all County and/or Municipality planning and zoning requirements or this Business Tax Receipt may be revoked and all taxes paid would be forfeited.
- The information contained on this Business Tax Receipt must be kept up to date. Contact the Volusia County Revenue Division for instructions on making changes to your account.

**THIS PORTION OF THE BUSINESS TAX RECEIPT MUST BE
POSTED CONSPICUOUSLY IN YOUR PLACE OF BUSINESS**

Volusia County Business Tax Receipt

Revenue Division - 123 W Indiana Ave, Room 103, DeLand, FL 32720 – (386) 736-5938

DATE PAID: 07/27/2020
RECEIPT #: BT 1-19-0004796
TOTAL TAX: 18.00
PENALTY: 0.00
TOTAL PAID: 18.00



Business Name: SABOUNGI CONSTRUCTION
Owner Name: HASSAN SABOUNGI
Mailing Address: 290 N US HWY 1 STE A
ORMOND BEACH, FL 32174



Account # 199205280003 Expires: September 30, 2021
Business Location: 290 N US HWY 1

PLEASE DETACH THIS PORTION OF THE BUSINESS TAX RECEIPT FOR YOUR RECORDS



"ATTACHMENT 1" ITB 21-13 SCHEDULE OF UNIT PRICING
BID FORM

CITY OF PORT ORANGE

ITB 21-13 Renovation and Expansion of The REC

Completed Attachment 1 Bid Proposal form MUST be included with Bid Submission

Instruction to save Attachment from Demandstar website:
Perform "File Save As" and save spreadsheet to your computer. Fill in pricing in the highlighted cells electronically.

Bidders are required to complete all fields shaded in green. All other fields will be automatically calculated, if submitted electronically.

NAME OF BUSINESS: Saboungi Construction, Inc.

CONTACT PERSON: Hassan Saboungi

EMAIL ADDRESS: info@saboungiconstruction.com

AUTHORIZED SIGNATURE:

Hassan Saboungi

ITEM #	DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	EXTENDED COST
1	Mobilization	1	LS	\$ 132,000.00	\$ 132,000.00
2	Demolition	1	LS	\$ 62,000.00	\$ 62,000.00
3	General Construction	1	LS	\$ 3,697,200.00	\$ 3,697,200.00
Schedule of Additive Alternates					
1	Alt No. 1: Remove & Replace Existing ACU/AHU Equipment in Gym #1	1	LS	\$ 125,800.00	\$ 125,800.00
2	Alt No. 2: Provide Welded Extruded Walkway Cover & Foundation	1	LS	\$ 55,400.00	\$ 55,400.00
3	Alt No. 3: Provide U.V. Filtration System in the new HVAC Systems	1	LS	\$ 11,800.00	\$ 11,800.00
4	Alt No. 4: Provide Automatic Hands-Free Flush Valves on Urinals & Water Closets, Automatic Hands-Free Soap & Paper Towel Dispensers	1	LS	\$ 16,540.00	\$ 16,540.00
5	Alt No. 5: Provide Indoor Play-Structure	1	LS	\$ 50,000.00	\$ 50,000.00
				Additive Alternates Subtotal	\$ 259,540.00
				TOTAL BID	\$ 4,150,740.00

Confirm the number of calendar days to complete upon receipt of PO:

305

Days

Shall warrant all materials, labor and workmanship for the minimum period of:

One (1)

Years

AWARD: THIS BID WILL BE AWARDED TO THE LOWEST, RESPONSIVE, RESPONSIBLE BIDDER



"ATTACHMENT 1" ITB 21-13 SCHEDULE OF UNIT PRICING
BID FORM

CITY OF PORT ORANGE

ITB 21-13 Renovation and Expansion of The REC

Completed Attachment 1 Bid Proposal form MUST be included with Bid Submission

Perform "File Save As" and save spreadsheet to your computer. Fill in pricing in the highlighted cells electronically.

Bidders are required to complete all fields shaded in green. All other fields will be automatically calculated, if submitted electronically.

NAME OF BUSINESS: Saboungl Construction, Inc.

CONTACT PERSON: Hassan Saboungl, V.P.

EMAIL ADDRESS: Hassan@sabounglconstruction.com

AUTHORIZED SIGNATURE: 

ITEM #	DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	EXTENDED COST
1	Mobilization	1	LS	\$ 126,700.00	\$ 126,700.00
2	Demolition	1	LS	\$ 55,000.00	\$ 55,000.00
3	General Construction	1	LS	\$ 3,541,600.00	\$ 3,541,600.00
Schedule of Additive Alternates					
1	Alt No. 1: Remove & Replace Existing ACU/AHU Equipment in Gym #1	1	LS	\$ 119,610.00	\$ 119,610.00
2	Alt No. 2: Provide Welded Extruded Walkway Cover & Foundation	1	LS	\$ 48,423.00	\$ 48,423.00
3	Alt No. 3: Provide U.V. Filtration System in the new HVAC Systems	1	LS	\$ 8,159.00	\$ 8,159.00
4	Alt No. 4: Provide Automatic Hands-Free Flush Valves on Urinals & Water Closets, Automatic Hands-Free Soap & Paper Towel Dispensers	1	LS	\$ 13,670.00	\$ 13,670.00
5	Alt No. 5: Provide Indoor Play-Structure	1	LS	\$ 50,000.00	\$ 50,000.00
				Additive Alternates Subtotal	\$ 239,862.00
				TOTAL BID	\$ 3,963,162.00
Confirm the number of calendar days to complete upon receipt of PO:				\$ 305.00	Days
Shall warrant all materials, labor and workmanship for the minimum period of:				ONE	Years
AWARD: THIS BID WILL BE AWARDED TO THE LOWEST, RESPONSIVE, RESPONSIBLE BIDDER					



Ron DeSantis, Governor

Halsey Beshears, Secretary



STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

SABOUNGI, HASSAN

SABOUNGI CONSTRUCTION INC
290A NORTH U S HIGHWAY #1
ORMOND BEACH FL 32174-4504

LICENSE NUMBER: CGC038667

EXPIRATION DATE: AUGUST 31, 2022

Always verify licenses online at MyFloridaLicense.com



Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

Request for Taxpayer Identification Number and Certification

► Go to www.irs.gov/FormW9 for instructions and the latest information.

Give Form to the
requester. Do not
send to the IRS.

Print or type.
See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

Saboungi Construction, Inc.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☒ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ►

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ►

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

290A North US Highway 1

6 City, state, and ZIP code

Ormond Beach, FL 32174

7 List account number(s) here (optional)

Requester's name and address (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

____ - ____ - ____

or

Employer identification number

5 9 - 2 2 1 9 0 5 5

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign
Here

Signature of
U.S. person ►

Date ► April 19, 2021

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.

BID BOND

BID BOND

Bond No.: N/A

KNOW ALL MEN BY THESE PRESENTS that Saboungi Construction, Inc, as Contractor, duly authorized to conduct business in the State of Florida, whose principal place of business is located at 290 A North US Highway 1, Ormond Beach, FL 32174, Tel.: 386-672-2077, (hereinafter called "PRINCIPAL"), and Westfield Insurance Company, as SURETY, duly authorized to conduct business in the State of Florida, whose principal place of business is located at PO Box 5001, Westfield Center, OH 44251, Tel.: N/A (hereinafter called "SURETY"), are held and firmly bound unto the City of Port Orange, Florida, as CITY, a Florida municipal corporation, whose address is City of Port Orange, 1000 City Center Circle, Port Orange, Florida 32129, Tel.: (386) 506-5501, (hereinafter called "OBLIGEE" or "CITY"), in the penal sum of Five Percent of Amount Bid dollars and (00)/100 (\$ 5% of Amount Bid), lawful money of the United States, for the payment of which sum shall and truly be made, whereof PRINCIPAL and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that, whereas the Principal has submitted the accompanying bid, dated April 19th, 2021, for:

Project Name / Bid No.: ITB#21-13 - Port Orange Gymnasium Renovation

Project Address: 4655 City Center Circle, Port Orange, FL 32129

Legal Description: 4655 City Center Circle, Port Orange, FL 32129

Description of Work: Port Orange Gymnasium Renovation

NOW, THEREFORE,

A. If the principal shall not withdraw said bid within one hundred twenty (120) days after date of opening of the same, and shall within ten (10) days after the prescribed forms are presented to it for signature, enter into a written contract with the City in accordance with the bid as accepted, and give bonds with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract, then the above obligations shall be void and of no effect, otherwise to remain in full force and virtue.

B. In the event of the withdrawal of said bid within the period specified, or the failure to enter into such contract and give such bonds within the time specified, if the principal shall pay the City the difference between the amount specified in said bid and the amount for which the City may procure the required work and supplies, if the latter amount be in excess of the former, then the above obligations shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above parties have executed this instrument under their several seals, this 19th day of April, A.D. 20 21, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Note: If the firm is a sole ownership or partnership including limited liability company, two (2) witnesses are required to attest the signature. If the firm is a corporation, then the corporate secretary shall attest and affix the corporate seal (Attach power of attorney to original bid bond and financial statement of Surety Company).

PRINCIPAL: Saboungi Construction, Inc

Hassan Saboungi
Signature
Hassan Saboungi, J.P.
Corporate Officer & Title

ATTEST:

Maisa Saboungi
Signature
Maisa Saboungi
Corporate Secretary (Affix Corporate Seal)

WITNESSES:

Darlene Mills
Shirley T. Lisi

SURETY: Westfield Insurance Company

Laura D. Mosholder
Attorney-in-Fact (signature)
Laura D. Mosholder
Name & Title
Laura D. Mosholder
Name of Local Resident Agent
Sanford, FL 32771
City, State, Zip
407-330-3990
Telephone:
A.M. Best No.: A NAIC No.: XV

ATTEST:

Kailee Stone
Signature
Kailee Stone
~~Corporate Secretary~~ (Affix Corporate Seal)
Witness

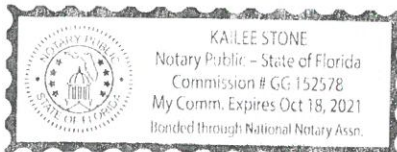


STATE OF Florida
COUNTY OF Palm Beach

Before me this day personally appeared Laura D. Mosholder (affiant), who, being duly sworn, deposes and says that he/she is the Attorney-in-Fact for the Westfield Insurance Company (corporate surety) and that this person has been authorized by Westfield Insurance Company (corporate surety) to execute the foregoing bond on behalf of the Contractor named therein in favor of the City of Port Orange, Florida.

Laura D. Mosholder
Signature of Affiant

Sworn to / Affirmed and subscribed before me this 19th day of April, 20 21, by Laura D. Mosholder who is personally known to me or who produced _____ as identification.



Kailee Stone
NOTARY PUBLIC - STATE OF
Type or print name: Kailee Stone
Commission No.: GG152578
Commission Expires: 10/18/2021
(Seal)

END OF BID BOND

This document must be completed and returned with your Submittal

General
Power
of Attorney

CERTIFIED COPY

POWER NO. 0994782 01

Westfield Insurance Co.
Westfield National Insurance Co.
Ohio Farmers Insurance Co.
Westfield Center, Ohio

Know All Men by These Presents, That WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY, corporations, hereinafter referred to individually as a "Company" and collectively as "Companies," duly organized and existing under the laws of the State of Ohio, and having its principal office in Westfield Center, Medina County, Ohio, do by these presents make, constitute and appoint

LAURA D. MOSHOLDER, EDWARD M. CLARK, JOINTLY OR SEVERALLY

of **SANFORD** and State of **FL** its true and lawful Attorney(s)-in-Fact, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver **any and all bonds, recognizances, undertakings, or other instruments or contracts of suretyship**.

LIMITATION: THIS POWER OF ATTORNEY CANNOT BE USED TO EXECUTE NOTE GUARANTEE, MORTGAGE DEFICIENCY, MORTGAGE GUARANTEE, OR BANK DEPOSITORY BONDS.

and to bind any of the Companies thereby as fully and to the same extent as if such bonds were signed by the President, sealed with the corporate seal of the applicable Company and duly attested by its Secretary, hereby ratifying and confirming all that the said Attorney(s)-in-Fact may do in the premises. Said appointment is made under and by authority of the following resolution adopted by the Board of Directors of each of the WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY:

"Be It Resolved, that the President, any Senior Executive, any Secretary or any Fidelity & Surety Operations Executive or other Executive shall be and is hereby vested with full power and authority to appoint any one or more suitable persons as Attorney(s)-in-Fact to represent and act for and on behalf of the Company subject to the following provisions:

The Attorney-in-Fact may be given full power and authority for and in the name of and on behalf of the Company, to execute, acknowledge and deliver, any and all bonds, recognizances, contracts, agreements of indemnity and other conditional or obligatory undertakings and any and all notices and documents canceling or terminating the Company's liability thereunder, and any such instruments so executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed by the President and sealed and attested by the Corporate Secretary."

"Be it Further Resolved, that the signature of any such designated person and the seal of the Company heretofore or hereafter affixed to any power of attorney or any certificate relating thereto by facsimile, and any power of attorney or certificate bearing facsimile signatures or facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached." (Each adopted at a meeting held on February 8, 2000).

In Witness Whereof, WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY have caused these presents to be signed by their **National Surety Leader** and **Senior Executive** and their corporate seals to be hereto affixed this **02nd** day of **JANUARY** A.D., **2020**.

Corporate
Seals
Affixed



WESTFIELD INSURANCE COMPANY
WESTFIELD NATIONAL INSURANCE COMPANY
OHIO FARMERS INSURANCE COMPANY

By:
Gary W. Stumper, National Surety Leader and Senior Executive

State of Ohio
County of Medina ss.:

On this **02nd** day of **JANUARY** A.D., **2020**, before me personally came **Gary W. Stumper** to me known, who, being by me duly sworn, did depose and say, that he resides in **Hartford, CT**; that he is **National Surety Leader** and **Senior Executive** of WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY, the companies described in and which executed the above instrument; that he knows the seals of said Companies; that the seals affixed to said instrument are such corporate seals; that they were so affixed by order of the Boards of Directors of said Companies; and that he signed his name thereto by like order.

Notarial
Seal
Affixed



David A. Kotnik, Attorney at Law, Notary Public
My Commission Does Not Expire (Sec. 147.03 Ohio Revised Code)

State of Ohio
County of Medina ss.:

I, **Frank A. Carrino**, Secretary of WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney, executed by said Companies, which is still in full force and effect; and furthermore, the resolutions of the Boards of Directors, set out in the Power of Attorney are in full force and effect.

In Witness Whereof, I have hereunto set my hand and affixed the seals of said Companies at Westfield Center, Ohio, this **19th** day of **April** A.D., **2021**.



Frank A. Carrino, Secretary



NOTICE OF INTENT TO AWARD

ITB #21-13 RENOVATION AND EXPANSION OF THE REC April 27, 2021

On April 19, 2021, the Purchasing Division of the City of Port Orange received five (5) bids for ITB #21-13 Renovation and Expansion of the REC.

After review of the responses, City Staff has made a recommendation to award to the lowest responsive and responsible bidder, Saboungi Construction, Inc.

This recommendation to award will be presented to City Council for approval on an upcoming agenda. Interested parties may review the City Council agenda at <https://www.port-orange.org/776/Agendas-and-Minutes>.

**Michael Hall
Purchasing Agent**



Community Services

www.volusia.org

April 9, 2019

Amanda Lasecki, Grants Manager
City of Port Orange
1000 City Center Circle
Port Orange, Florida 32129

**RE: ECHO Grant Award 19-11
REC Center Phase I**

Dear Ms. Lasecki,

Congratulations! On March 19, 2019 the Volusia County Council approved the ECHO Advisory Committee recommendation of your ECHO Grants-in-Aid award. Attached are the documents you need to complete the award process. The following action steps are required to move toward receiving the Notice to Proceed:

1. Two original ECHO Agreements – have appropriate authority sign the document in the “Grantee” section and witnesses sign as required.
2. Restrictive Covenants – provide legal description of the project property to the ECHO office for review and approval. Once approved, complete, duly sign, witness, notarize and record restrictive covenant with the legal description of the project property as a part thereof, with the Volusia County Clerk of the Court and a copy of the filed document provided to this ECHO office.
3. One Original Letter Contract – have appropriate authority sign the document on the line marked “Agency (Grantee) Acknowledgement”. Sign the line marked by a red “X” and only that one place. This document will be processed by ECHO staff. It is the document that allows us to encumber funds specific to your project.

Return all signed documents in one packet to the County ECHO office no later than May 10, 2019. Please include your grant number (19-11) on all correspondence. Once the County executes the agreement we will provide a copy to your office.

123 West Indiana Avenue, Room 100 • Deland, FL 32720 Tel:
386-943-7029 • FAX: 386-740-5101

www.volusia.org

Page 1984 of

A Notice to Proceed will be forwarded to you upon receipt of the completed documentation. Your expeditious processing of the attached documents is critical to continuing the award process.

On behalf of the ECHO staff, I want to once again congratulate you on your grant award. We look forward to working with your organization to ensure the successful completion of this project to realize the goals of the ECHO Program. Please contact me at (386) 736-5955 or chall@volusia.org if you have any further questions.

Sincerely,



Carmen Hall
Operations Manager
Community Services Department

County of Volusia ECHO Grants-in-Aid Agreement

WHEREAS, the voters of Volusia County overwhelmingly approved the Volusia ECHO ballot initiative, as outlined in Resolution 2000-156, and affirmed their desire to have a long-term development program that funds projects that enhance the quality of life in Volusia County by ensuring the availability of environmental, cultural, historical, and outdoor recreational opportunities, and

WHEREAS, Resolution 2000-156 sets forth objectives, criteria, and procedures for implementation of the Volusia ECHO Program, and

WHEREAS, the County of Volusia Community Services Department has budgeted funds for eligible ECHO projects, and

WHEREAS, the County of Volusia has determined that Project No. 19-11, a project of the City of Port Orange, is eligible for Volusia ECHO funding.

AGREEMENT

The County of Volusia, 123 W. Indiana Avenue, DeLand, Florida (hereinafter referred to as the "County"), and in the County of Volusia (hereinafter referred to as "Grantee"), agree as follows:

1. Within the 2018-2019 grant cycle, the County of Volusia shall designate funds not to exceed \$400,000.00, to be held for the Grantee, for the performance of items approved for funding which are described and attached hereto as "Exhibit A", (Grantee's application), and any other requirement made a part of this agreement.
2. The funds will be made available to the Grantee on a 1:1 match basis as detailed in "Exhibit A" and expenditures reimbursed on a quarterly basis, unless otherwise agreed upon by the County, only if the Grantee has maintained all grant requirements and upon the Grantee providing:
 - A Quarterly Project Report and a Reimbursement Request Form with backup documentation (Exhibit B - explaining encumbrances and expenditures and project status report).
 - Not for Profit Organizations shall provide Release of Liens.
3. Ten (10) percent of the grant funds will be withheld until the total project and final reports are completed as described in "Exhibit C" (ECHO application guide).
4. It is understood between the parties that the amount of funds designated in paragraph 1 above is the maximum amount the County will provide and the County shall only pay eligible expended costs, as they are concurrently matched 1:1 by the applicant, unless otherwise approved by the County.
5. The expiration date of this grant will be exactly 730 days after the execution of this agreement unless the County grants an extension as provided for in the grant application guide (Exhibit C). The ECHO funds and all cash match must be encumbered within the initial 365 days following the execution of this grant agreement but final payments for services and completion of the project construction may be extended up to another 365-day period. Extensions beyond the 730-day period may restrict the Grantee or any other organization from applying for additional ECHO grants for this project or phase of this project until this current grant agreement is concluded. To be considered for an extension, a written request must be sent to the Parks, Recreation and Culture ECHO Program Coordinator prior to sixty days of the grant agreement expiration date and must state the reasons for the request and provide a new completion date. The County will notify the Grantee in writing within thirty days of receipt of the request for extension approving or denying said request.

6. The Grantee agrees to conduct the project according to the plans and specifications provided in "Exhibit A." All major deviations and/or major changes in scope or venue must receive prior written approval of the County Council and may result in the revocation of this grant. Minor changes may be approved through the ECHO Program Coordinator. Such approval shall not be unreasonably withheld.
7. Understand that this is an annual grant of money only and that this agreement does not obligate the County to provide additional funds for the project or to be responsible for the completion of the project or the operation and maintenance of the project before or after the project is completed.
8. Grantee fully understands its obligation to maintain the facility in clean working order and maintain and/or replace equipment, furnishings, and items described in this grant and/or purchased as part of this grant project for the public use as described in the application. This project shall remain open and in operation as set forth in exhibit A for a period of 30 years.
9. The Grantee fully understands that there will be no reimbursement for obligations or expenditures made prior to the execution of this agreement or after the agreement has ended unless the project is a Historic Reimbursement Grant.
10. The Grantee shall provide all additional monies necessary to complete the project according to "Exhibit A" which shall include competent evidence, prior to the signing of the agreement, of its ability to complete the project. The Grantee shall have all matching funds on deposit in its account or valid contracts for grants from other entities prior to proceeding with the ECHO project. Grantee shall furnish the County with evidence of the matching funds in order to receive a Notice to Proceed. Grantee shall not encumber any ECHO project funds without a Notice to Proceed.
11. To the extent allowed by law, the Grantee agrees to hold the County harmless from any and all claims, liabilities, rights, and obligations arising out of the development and operation of this project as described in "Exhibit A."
12. Signage showing the County of Volusia involvement is required:
 - a. Within 90 days of award, one (1) 4' x 8' exterior sign shall be placed in a prominent public location. See "Exhibit D" for design and wording.
 - b. Upon completion of the project, one (1) permanent 8 sq. ft. sign shall be placed on site in a prominent public location. See "Exhibit E" for design, wording, and material.

Note: Alternative signage and/or appropriate material may be considered when the need or reasonableness for the alternative sign is proven. A written request with a drawing to scale of the proposed changes must be sent to the ECHO Program Coordinator for approval. The ECHO Program Coordinator will respond in writing within 14 days after receipt of the Grantee's written request.
13. The Grantee shall provide a program report annually over the agreement period in a format directed by the County.
14. The Grantee agrees to be bound to special conditions to the grant attached hereto and made a part of this agreement as "Exhibit F," the Restrictive Covenants.
15. The Grantee agrees to provide a payment and performance bond, naming the County of Volusia as co-obligee, for all contracted work prior to expenditure of ECHO funds. All work performed prior to receiving proof of the bond may be determined by the County as ineligible for reimbursement.
16. The Grantee agrees to be responsible for and comply with all local, State, and Federal permits and laws.
17. The Grantee agrees that failure to comply with this agreement, and all attached documents which are part of this agreement, may result in the Grantee repaying the grant funds, in part or whole, to

the County. In addition, the Grantee agrees that failure to comply with all requirements may result in its being denied future grant funds for other projects under the ECHO grant program.

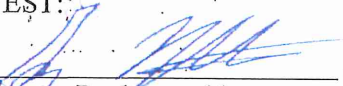
18. Trails and projects on public lands not owned by the applicant: In lieu of the Restrictive Covenants and unrestricted ownership, for trails projects that are part of the County's Trails Master Plan approved by the County Council or projects on State and Federal lands, the public right of continuing access and undisturbed use shall be provided by a Use Permit, Land Management Agreement, or Project Management Agreement to which the applicant is party. If the Agreement is dissolved prior to the end of the time period stated in the Agreement that is included as part of the ECHO Grant Agreement or the project is deconstructed or no longer available for public use for the time period required based on the type of project (section 1.5, 2 in the ECHO Guide), the grantee shall repay the County in the manner set forth in the Restrictive Covenants, as shown in section 1.6 of the ECHO Application Guide, section 3.

By their hands and seals, the duly authorized officers or representatives of these respective parties execute this document this 19th day of March.

COUNTY COUNCIL
VOLUSIA COUNTY, FLORIDA

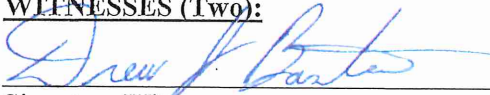
By: 
Edward Kelley
County Chair

ATTEST:

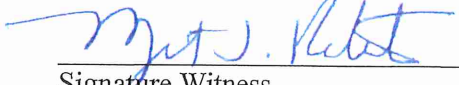
By: 
George Recktenwald
County Manager

GRANTEE SIGNATURES

WITNESSES (Two):


Signature Witness

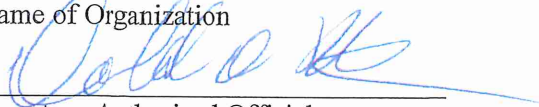
Drew J. Bastian
Printed Name of Witness


Signature Witness

Margaret T. Roberts
Printed Name of Witness

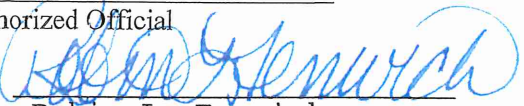
GRANTEE

City of Port Orange
Name of Organization


Signature Authorized Official

Donald O. Burnette
Printed Name of Authorized Official

Mayor
Title of Authorized Official

ATTEST: 
Robin L. Fenwick
City Clerk



Community Services
www.volusia.org

May 18, 2020

Amanda Lasecki, Grants Manager
City of Port Orange
1000 City Center Circle
Port Orange 32129

RE: **ECHO Grant Award 20-10**
REC Center Phase II

Dear Ms. Lasecki,

Having received a copy of the Restrictive Covenants and all of the current required documents, we are issuing this letter to you, which serve as the official Notice-To-Proceed for ECHO grant project **20-10 City of Port Orange, REC Center Phase II**. **Before beginning construction**, the following items are required:

- Bid documentation showing names of companies, prices, and selected vendors.
- Final Design Drawings, if revised from application.
- A Performance Bond naming the County of Volusia as Co-obligee (amount = ECHO & match installation value).
- Documentation of the encumbrance of funds associated with this project.

You are required to file quarterly project status reports and reimbursement requests (even if there is no construction activity or reimbursements requested) as stated in item 2 of the ECHO Grants-In-Aid Agreement and in the format as indicated in Exhibit B of the Agreement. After the total reimbursement has been made to you, only an annual report will be required to provide information relative to use of the facility. Please be sure to provide your grant number **20-10** on all reports. Forms for the quarterly reports will be emailed to you prior to the end of the quarter. The following is the schedule for the first year quarterly project development reports and reimbursement requests unless otherwise advised:

123 West Indiana Avenue, Room 100 • Deland, FL 32720 Tel:
386-943-7029 • FAX: 386-740-5101

www.volusia.org

REPORT PERIOD	DUE DATE
July 1 – Sept 30	October 15
Oct. 1 – Dec. 31	January 15
Jan. 1 – March 31	April 15
April 1 – June 30	July 15

It is critical that we receive your reports/requests in our office by the above deadlines as it will ensure a smooth reimbursement process, provide timely feedback on your progress to the County Council and the ECHO Advisory Committee, and will establish your ability to administer this grant or grants that you may apply for in the future.

On behalf of the ECHO staff, I want to again congratulate you on your grant award. We look forward to working with you to ensure the successful completion of this project to realize the goals of the ECHO Program. Please contact me at (386) 736-7029 or chall@volusia.org if you have further questions.

Sincerely,



Carmen Hall, Director
Community Assistance Division

FILE: 20-10

County of Volusia ECHO Grants-in-Aid Agreement

WHEREAS, the voters of Volusia County overwhelmingly approved the Volusia ECHO ballot initiative, as outlined in Resolution 2000-156, and affirmed their desire to have a long-term development program that funds projects that enhance the quality of life in Volusia County by ensuring the availability of environmental, cultural, historical, and outdoor recreational opportunities, and

WHEREAS, Resolution 2000-156 sets forth objectives, criteria, and procedures for implementation of the Volusia ECHO Program, and

WHEREAS, the County of Volusia Community Services Department has budgeted funds for eligible ECHO projects, and

WHEREAS, the County of Volusia has determined that Project No. 20-10, a project of the City of Port Orange, is eligible for Volusia ECHO funding.

AGREEMENT

The County of Volusia, 123 W. Indiana Avenue, DeLand, Florida (hereinafter referred to as the "County"), and in the County of Volusia (hereinafter referred to as "Grantee"), agree as follows:

1. Within the 2019-2020 grant cycle, the County of Volusia shall designate funds not to exceed \$400,000.00, to be held for the Grantee, for the performance of items approved for funding which are described and attached hereto as "Exhibit A", (Grantee's application), and any other requirement made a part of this agreement.
2. The funds will be made available to the Grantee on a 1:1 match basis as detailed in "Exhibit A" and expenditures reimbursed on a quarterly basis, unless otherwise agreed upon by the County, only if the Grantee has maintained all grant requirements and upon the Grantee providing:
 - A Quarterly Project Report and a Reimbursement Request Form with backup documentation (Exhibit B - explaining encumbrances and expenditures and project status report).
 - Not for Profit Organizations shall provide Release of Liens.
3. Ten (10) percent of the grant funds will be withheld until the total project and final reports are completed as described in "Exhibit C" (ECHO application guide).
4. It is understood between the parties that the amount of funds designated in paragraph 1 above is the maximum amount the County will provide and the County shall only pay eligible expended costs, as they are concurrently matched 1:1 by the applicant, unless otherwise approved by the County.
5. The expiration date of this grant will be exactly 730 days after the execution of this agreement unless the County grants an extension as provided for in the grant application guide (Exhibit C). The ECHO funds and all cash match must be encumbered within the initial 365 days following the execution of this grant agreement but final payments for services and completion of the project construction may be extended up to another 365-day period. Extensions beyond the 730-day period may restrict the Grantee or any other organization from applying for additional ECHO grants for this project or phase of this project until this current grant agreement is concluded. To be considered for an extension, a written request must be sent to the ECHO Program Coordinator prior to sixty days of the grant agreement expiration date and must state the reasons for the request and provide a new completion date. The County will notify the Grantee in writing within thirty days of receipt of the request for extension approving or denying said request.

6. The Grantee agrees to conduct the project according to the plans and specifications provided in "Exhibit A." All major deviations and/or major changes in scope or venue must receive prior written approval of the County Council and may result in the revocation of this grant. Minor changes may be approved through the ECHO Program Coordinator. Such approval shall not be unreasonably withheld.
7. Understand that this is an annual grant of money only and that this agreement does not obligate the County to provide additional funds for the project or to be responsible for the completion of the project or the operation and maintenance of the project before or after the project is completed.
8. Grantee fully understands its obligation to maintain the facility in clean working order and maintain and/or replace equipment, furnishings, and items described in this grant and/or purchased as part of this grant project for the public use as described in the application. This project shall remain open and in operation as set forth in exhibit A for a period of 40 years.
9. The Grantee fully understands that there will be no reimbursement for obligations or expenditures made prior to the execution of this agreement or after the agreement has ended unless the project is a Historic Reimbursement Grant.
10. The Grantee shall provide all additional monies necessary to complete the project according to "Exhibit A" which shall include competent evidence, prior to the signing of the agreement, of its ability to complete the project. The Grantee shall have all matching funds on deposit in its account or valid contracts for grants from other entities prior to proceeding with the ECHO project. Grantee shall furnish the County with evidence of the matching funds in order to receive a Notice to Proceed. Grantee shall not encumber any ECHO project funds without a Notice to Proceed.
11. To the extent allowed by law, the Grantee agrees to hold the County harmless from any and all claims, liabilities, rights, and obligations arising out of the development and operation of this project as described in "Exhibit A."
12. Signage showing the County of Volusia involvement is required:
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13. The Grantee shall provide a program report annually over the agreement period in a format directed by the County.
14. The Grantee agrees to be bound to special conditions to the grant attached hereto and made a part of this agreement as "Exhibit F," the Restrictive Covenants.
15. The Grantee agrees to provide a payment and performance bond, naming the County of Volusia as co-obligee, for all contracted work prior to expenditure of ECHO funds. All work performed prior to receiving proof of the bond may be determined by the County as ineligible for reimbursement.
16. The Grantee agrees to be responsible for and comply with all local, State, and Federal permits and laws.
17. The Grantee agrees that failure to comply with this agreement, and all attached documents which are part of this agreement, may result in the Grantee repaying the grant funds, in part or whole, to

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By their hands and seals, the duly authorized officers or representatives of these respective parties execute this document this 3rd day of March, 2020.

COUNTY COUNCIL
VOLUSIA COUNTY, FLORIDA

By: Ed Kelley
Edward Kelley
County Chair

ATTEST:

By: George Recktenwald
George Recktenwald
County Manager

GRANTEE SIGNATURES

WITNESSES (Two):

Robin Fenwick
Signature Witness

Robin Fenwick
Printed Name of Witness

Shannon K. Balmer
Signature Witness

Shannon K. Balmer
Printed Name of Witness

GRANTEE

City of Port Orange
Name of Organization

Donald O. Burnette
Signature Authorized Official

Donald O. Burnette
Printed Name of Authorized Official

Mayor
Title of Authorized Official



February 9, 2021

Mr. Peter Ferreira
The City of Port Orange
1000 City Center Circle
Port Orange, FL 32129

Re: Daytona Beach Racing and Recreational Facilities District Notice of Grant Award

Dear Mr. Ferreira:

I am happy to report that, on January 26, 2021 the Daytona Beach Racing and Recreational Facilities District (the "District") approved the grant request of The City of Port Orange ("Recipient"), for the Indoor Playground in the amount of \$225,000 ("Awarded Project") pursuant to Recipient's grant request dated January 5, 2021.

Based on the amount of the Awarded Funds for Indoor Playground, the District will pay the Awarded Funds over 2 years. The first check, in the amount of \$112,500, will be delivered to the address above, upon receipt of your original signature below (unless you would like to schedule a time to drop off your original signature and pick-up the check. The final installment, in the amount of \$112,500, will be delivered to the address above in approximately 12 months, after the District receives proof that Recipient has continued to comply with the scope of the Awarded Project.

All payments of Awarded Funds from the District are expressly subject to the District's ability to make payments from then-existing available funds without use of reserve funds. If the District's available cash proceeds are not sufficient to pay all annual payments for previously awarded grants for all recipients (including awards of other recipients), the District will use reasonable efforts to pay a pro rata amount of each annual payment for each award based on the total due for all awards in that year, until the District has sufficient funds to pay all awards in full.

Please note that the Recipient is responsible for notifying the District, in writing, if the Recipient's address changes. The District has no duty to send any check to any address except for the address above or such other address change provided in writing to the District. The District's award and all current and future payment obligations, if any, will expire six (6) months from the Award Date unless the Recipient deposits the District's check by such deadline (or 18 months from the Award Date for the second annual payment if any or 30 months from the Award Date for the third annual payment if any). If a District check(s) is not deposited by the Recipient, for any reason, prior to such deadline unless the District provides for an extension of such deadline in writing, the District's award to the Recipient will lapse without further notice, and the Recipient will have no right to receipt of that payment or any future payments for the Awarded Project.

The Recipient is responsible for using the Awarded Funds in a manner which is consistent with the scope of the Awarded Project as outlined in the Recipient's grant request identified above and as approved by the District. Recipient agrees to notify the District in writing of any changes to the use of the Awarded Funds and the scope of the Awarded Project. The District may elect, in its sole and absolute discretion, to prohibit the Recipient from requesting future grants from the District, if the Recipient breaches its obligation to notify the District of any changes or its obligation to return any payments upon demand.

If there is a material change in the Awarded Project, as determined by the District commission in their sole and absolute discretion, the Recipient agrees to return any Awarded Funds already paid upon demand, which the District may require in its sole and absolute discretion and agrees that the District has no obligation to pay any remaining Awarded Funds, which the District may require in its sole and absolute discretion.

335 Bill France Boulevard, Daytona Beach, FL 32114
386-255-7355 phone, 376-255-5755 fax
www.daytonaracingdistrict.com

The District may, at any time, elect to delay any payment of Awarded Funds until receipt, satisfactory to the District, of the Recipient's material compliance with scope of the Awarded Project.

Also, along with the award, comes the responsibility of the recipient to provide an update, or updates, along with photos, of reasonable milestones of the Awarded Project. The update(s) and photos can be sent via USPS to the address below or via email to info@daytonaracingdistrict.com. Prior to receiving a second or third annual payment of Awarded Funds, if applicable, the Recipient is required to provide the District with an update of the Awarded Project and a statement that the Recipient continues to comply with the scope of the Awarded Project without material change.

To receive the check for your Awarded Funds, please sign below agreeing to the obligations and limitations above.

Again, congratulations on the District's funding of your Grant Request. We look forward to seeing the Awarded Project come to fruition. Please do not hesitate to email or call me with any questions.

Best regards,



Barbara Kelly
Executive Director

I, as Peter Ferreira of the City of Port Orange, which is the recipient of a grant award from the Daytona Beach Racing and Recreational Facilities District, have read and understand the foregoing. I have the authority to bind the Recipient and by signing below hereby agree, on behalf of the Recipient, to abide by the foregoing terms and conditions and agree to the limitations and restrictions provided herein.

Signature