

BID PROPOSAL CONTRACT DOCUMENTS AND SPECIFICATIONS FOR

WASHINGTON COUNTY CHIPLEY LIBRARY BRANCH EXPANSION

PREPARED FOR:

WASHINGTON COUNTY

Ashlynn Marquez

David Pettis, Jr. - Chair

Joey Brock

Wesley Griffin

David Corbin, Vice-Chair

Jeff Massey, County Administrator

Renae Rountree, Library Director



FUNDED BY:

Florida Department of Commerce
Grant No. BB201

PREPARED BY:



4428 Lafayette Street
Marianna, Florida 32446
Phone (850) 482-3045
Fax (850) 482-3957
EB-0005637



Released for Bid:
10/08/2025

C-110

TABLE OF CONTENTS

DIVISION C - BIDDING AND CONTRACT REQUIREMENTS

C-111	Advertisement for Bids
C-200	Instructions to Bidders
C-300	Bidders Checklist
C-410	Bid Form
C-430	Bid Bond (Penal Sum Form)
C-440	Certifications Regarding Equal Employment Opportunity
C-451	Qualifications Statement
C-470	Public Entity Crimes Statement
C-471	Drug Free Workplace Certification
C-472	Certification Regarding Lobbying
C-473	Certifications Regarding Section 3 and Segregated Facilities
C-474	Certifications Regarding Labor Standards and Prevailing Wage Requirements
C-480	Certification Regarding Debarment
C-510	Notice of Award
C-520	Agreement between Owner & Contractor
C-521	Certificate of Owner's Attorney
C-530	Federal Contract Provisions & 24 CFR
C-533	Wage Decision
C-550	Notice to Proceed
C-610	Performance Bond and Labor and Material
C-615	Payment Bond
C-620	Contractor's Application for Payment
C-625	Certificate of Substantial Completion
C-641	Certificate of Substantial Completion
C-650	Release of Lien
C-700	General Conditions
C-800	Supplementary General Conditions
C-940	Work Change Directive
C-941	Change Order
C-942	Field Order

PART 01 – CIVIL (DHM)

01010	Summary of Work
01026	Applications for Payment
01050	Field Engineering
01310	Construction Schedules
01340	Shop Drawings
01410	Testing and Testing Lab Services
01580	Project Identification Sign
01700	Contract Close-out
01720	Project Record Documents
01740	Warranties and Bonds

PART 02 – ARCHITECTURAL (DAG)

000101	Project Title Page
000102	Project Information
000103	Project Directory
000111	Table of Contents
020342	Removal and Salvage of Period Construction Materials
024100	Demolition
323313	Site Bicycle Racks
030516	Underslab Vapor Barrier – Stego
031000	Concrete Forms and Accessories
031521	Termite Barrier – Polyguard Products, Inc
033005	Moisture Vapor Reducing Admixture for Cast-in-Place Concrete – AVECS
033511	Concrete Floor Finishes
033543	Polished Concrete Finishing – Curecrete
030100	Maintenance of Concrete
040511	Mortar and Masonry Grout
047100	Simulated Brick
042000	Unit Masonry Assemblies
042600	Single-Wythe Unit Masonry
042300	Glass Unit Masonry
042723	Cavity Walls
040100	Masonry Restoration and Cleaning
040100	Maintenance of Masonry – MTI
050513.11	Shop-Applied Anodized Layer for Aluminum – Lorin Industries
055000	Metal Fabrications
057000	Ornamental Metal
057300	Ornamental Handrails and Railings
079513	Expansion Joint Cover Assemblies
050300	Conservation Treatment for Period Metals
060573	Wood Treatment
061000	Rough Carpentry
061053	Miscellaneous Rough Carpentry
061600	Sheathing – USG
062000	Finish Carpentry
064100	Custom Cabinets

PART 02 – ARCHITECTURAL (DAG) (CONT.)

070543	Cladding Support Systems
070553	Fire and Smoke Assembly Identification
072100	Board and Batt Insulation
072119	Foamed-in-Place Insulation
072500	Weather Barriers
072600	Vapor Retarders
072700	Air Barriers
074113	Metal Roof Panels
070150.19	Preparation for Re-Roofing
076200	Sheet Metal Flashing and Trim
077200	Roof Accessories
081113	Steel Doors and Frames
081416	Flush Wood Doors
087100	Door Hardware
087113	Power Door Operators
088000	Glazing
088300	Mirrors
092236	Lath
092400	Portland Cement Plaster
092116	Gypsum Board Assemblies
093000	Tile
095100	Suspended Acoustical Ceilings – USG
096500	Resilient Flooring
096813	Carpet Tile
099113	Exterior Paints
099123	Interior Paints
102113.13	Metal Toilet Compartments
089100	Wall Louvers
102600	Wall and Door Protection
102800	Toilet, Bath, and Laundry Accessories
123200	Wood Casework

PART 03 – PLUMBING (WATFORD)

22 01 00	Plumbing General
22 07 00	Insulation for Plumbing Equipment and Piping
22 11 13	Potable Water System
22 13 16	Soil, Waste, and Vent System
22 30 00	Plumbing Fixtures, Equipment, Trim & Schedule

PART 04 – MECHANICAL (WATFORD)

23 01 00	Mechanical General
23 05 13	Electric Motors
23 05 20	Pipes and Pipe Fittings
23 05 21	Piping Specialties
23 05 23	Valves

PART 04 – MECHANICAL (WATFORD) (CONT.)

23 05 29 Supports, Anchors, and Seals

PART 05 – ELECTRICAL (WATFORD)

260000 Electrical General Requirements
260519 Low-Voltage Electrical Power Conductors, Cables, & Devices
260530 Raceway Systems
262713 Service & Distribution
265000 Basic Electrical Materials & Methods
265100 Lighting

PART 06 – FIRE ALARM (WATFORD)

283100 Fire Detection and Alarm

PROJECT DRAWINGS

<u>Sheet</u>	<u>Title</u>
S001	Notes
S002	Wind Load Diagram
S100	Foundation Plan
S200	Framing Plan
S300	Foundation Details
S400	Framing Details
G-001	Cover Sheet
G-002	ADA Confluency
G-003	ADA Confluency
G-004	Abbreviations & Symbols
C001	Existing Conditions
C002	General Notes
C003	Demolition & Erosion Control Plan
C004	Site Plan
C005	Grading/Drainage Plan
C006	Utility Plan
C007	Site Details
C008	Utility Details
C009	Surface Water Management Plan
L001	Landscape Plan
LS001	Code Data
LS011	Fire Safety Plan Level 1
AD-111	Demolition Floor Plan
AD-112	Demolition Roof Plan
AD-113	Demolition Reflected Ceiling Plan
AD-121	Demolition Roof Plan
A-011	Partition Types
A-101	Assemblies
A-201	Architectural Site Plan

PROJECT DRAWINGS (CONT.)

<u>Sheet</u>	<u>Title</u>
A-111	Level 1 - Demolition Plan
A-112	Level 1 - Dimension Plan
A-113	Level 1 - Finish Plan
A-114	Level 1 - Reflected Ceiling Plan
A-115	Roof Plan
A-121	Roof Details
A-207	Exterior Elevations
A-301	Building Sections
A-311	Wall Sections
A-312	Wall Sections
A-401	Enlarged Room Plans & Elevations
A-411	Enlarged Bathroom Floor Plans & Elevations
A-511	Plan Details
A-601	Building Finish Schedule
A-602	Door & Windows Schedule
P-001	Legend, Notes, Schedule, Details
P-002	Plumbing Demolition and Riser Diagrams
P-101	Level 1 Plumbing Demolition Plan
P-111	Level 1 Plumbing Plan - Sanitary
P-112	Level 1 Plumbing Plan - Domestic Water
M-001	HVAC Legend, Notes and Schedules
M-101	Level 1 HVAC Demolition Plan
M-111	Level 1 HVAC Plan
M-201	HVAC Roof Plan
M-301	Fire Penetration Details
M-302	Fire Penetration Details
M-321	Mechanical Details
E-001	Electrical Legend, Notes & Details
E-002	Electrical Fixture Schedule and Details
E-004	Power Riser Diagrams and Details
E-100	Level 1 Electrical Plan
E-101	Electrical Power Plan
E-111	Electrical Reflected Ceiling Plan
E-121	Fire Alarm Plan
E-411	Electrical Site Plan

ATTACHMENT 01 – GEOTECHNICAL REPORT

Geotechnical Report – Southern Earth Sciences, Inc.

ADVERTISEMENT FOR BIDS

Washington County (Owner) is requesting Bids for the construction of the following Project:

WASHINGTON COUNTY CHIPLEY LIBRARY BRANCH EXPANSION

FLORIDA COMMERCE: BB201

DHM: WAS23LB

Bids for the Project will be received at the **Washington County Administrative Office** located at **1331 South Boulevard, Chipley, Florida 32428, until Thursday, December 4, 2025, 3:00 PM** local time. At that time, or shortly thereafter, the Bids received will be publicly opened and read at the Washington County Commission Meeting Room located within the Administrative Office.

The Project includes the following Work: The Project includes the construction of three (3) additions to the existing Washington County Chipley Library Branch, located on the north, east, and west sides of the facility, with a combined area of approximately 5,400 square feet. Work generally consists of building construction with associated architectural, structural, mechanical, electrical, and plumbing systems, together with all required site improvements including demolition, grading, drainage, utilities, and restoration. All work shall be completed in accordance with the Contract Documents and coordinated with the existing facility to provide a fully operational library expansion.

The Issuing Office for the Bidding Documents is:

DHM Melvin Engineering
4428 Lafayette Street, Marianna, Florida 32446
Email request: martivickery@melvineng.com
Office phone: (850) 482-3045

Prospective Bidders may obtain or examine the Bidding Documents at the Issuing Office on Monday through Friday between the hours of **8:00 AM – 4:00 PM** and may obtain copies of the Bidding Documents from the Issuing Office as described below. Partial sets of Bidding Documents will not be available from the Issuing Office. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including addenda, if any, obtained from sources other than the Issuing Office.

Bidding Documents may be purchased from the Issuing Office during the hours indicated above. Cost does not include shipping charges. Upon the Issuing Office's receipt of payment, printed Bidding Documents or electronic documents will be sent via the prospective Bidder's delivery service. The shipping charge amount will depend on the shipping method chosen. Bidding Documents are available for purchase in the following formats:

Format:

Bidding Documents (including Full-Size Drawings) - \$175.00

Bidding Documents (including Half-Size Drawings) - \$125.00

Bidding Documents (Electronic Copies) – No payment required.

Pre-bid Conference

A **mandatory pre-bid conference** for the Project will be held on **Wednesday, October 29, 2025 at 10:00 AM local time** at the **Chipley Library Meeting Room** located at **1444 W. Jackson Avenue, Chipley, Florida 32428**.

Instructions to Bidders.

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

This Advertisement is issued by:

Owner: **Washington County**
By: **Brent Melvin, P.E.**
Title: **Project Manager**

Small business and minority businesses, women's business enterprises, and labor surplus area firms are encouraged to submit proposals, and firms using such subcontractors are strongly encouraged to solicit such firms in the subcontracting process. Any Contracts/subcontracts issued under this procurement must comply with the necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible, in accordance with 2 CFR § 200.321.

EQUAL OPPORTUNITY EMPLOYER HANDICAP ACCESSIBLE/FAIR HOUSING JURISDICTION

C-200

INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	Page
Article 1— Defined Terms	1
Article 2— Bidding Documents.....	1
Article 3— Qualifications of Bidders.....	2
Article 4— Pre-Bid Conference	2
Article 5— Site and Other Areas; Existing Site Conditions; Examination of Site; Owner’s Safety Program; Other Work at the Site	2
Article 6— Bidder’s Representations and Certifications	5
Article 7— Interpretations and Addenda	5
Article 8— Bid Security	5
Article 9— Contract Times.....	6
Article 10— Substitute and “Or Equal” Items.....	6
Article 11— Subcontractors, Suppliers, and Others	6
Article 12— Preparation of Bid.....	7
Article 13— Basis of Bid.....	8
Article 14— Submittal of Bid	9
Article 15— Modification and Withdrawal of Bid	9
Article 16— Opening of Bids.....	10
Article 17— Bids to Remain Subject to Acceptance	10
Article 18— Evaluation of Bids and Award of Contract	10
Article 19— Bonds and Insurance	11
Article 20— Signing of Agreement	11

ARTICLE 1—DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.04 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.
- 2.05 *Electronic Documents*
- A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.
1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

- B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder must submit the following information (as applicable):
 - A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.
 - B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.
 - C. Bidder's state or other contractor license number, if applicable.
 - D. Subcontractor and Supplier qualification information.
 - E. Other required information regarding qualifications.
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

ARTICLE 4—PRE-BID CONFERENCE

- 4.01 A mandatory pre-bid conference will be held at the time and location indicated in the Advertisement or invitation to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.
- 4.02 Information presented at the pre-Bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.

ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

- 5.01 Site and Other Areas
 - A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of

materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

5.02 Existing Site Conditions

A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
 - a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.
 - b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.
 - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
4. *Geotechnical Baseline Report/Geotechnical Data Report:* The Bidding Documents contain a Geotechnical Baseline Report (GBR) and Geotechnical Data Report (GDR).
 - a. As set forth in the Supplementary Conditions, the GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations ("Baseline Conditions"). The GBR is a Contract Document.
 - b. The Baseline Conditions in the GBR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GBR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.
 - c. Nothing in the GBR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

- d. As set forth in the Supplementary Conditions, the GDR is a Contract Document containing data prepared by or for the Owner in support of the GBR.
 - B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.
- 5.03 Other Site-related Documents
- A. No other Site-related documents are available.
- 5.04 Site Visit and Testing by Bidders
- A. It is recommended that bidders visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.
 - B. A Site visit is scheduled following the pre-bid conference. Maps to the Site will be available at the pre-Bid conference.
 - C. Bidders visiting the Site are required to arrange their own transportation to the Site.
 - D. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner or Engineer contact for visiting the Site: **SEE ADVERTISEMENT**. Bidder must conduct the required Site visit during normal working hours.
 - E. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
 - F. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.
 - G. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
 - H. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.
- 5.05 Owner's Safety Program
- A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.06 Other Work at the Site

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 6—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

- A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder’s examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.
- B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

- 7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.
- 7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:

Brent Melvin, P.E.

brentmelvin@melvineng.com

**RE: WAS23LB – Chipley Library Branch Expansion RFI
4428 Lafayette Street, Marianna, Florida, 32446**

- 7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.
- 7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **5%** percent of Bidder’s maximum Bid price (determined by adding the base bid and all alternates) and in the

form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.

- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.
- 9.02 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

- 10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those "or-equal" or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an "or-equal" or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer within 10 days of the issuance of the Advertisement for Bids or invitation to Bidders. Each such request must comply with the requirements of Paragraphs 7.05 and 7.06 of the General Conditions, and the review of the request will be governed by the principles in those paragraphs. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all registered Bidders. Bidders cannot rely upon approvals made in any other manner.
- 10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as

supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 11.01 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.
- 11.02 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed for those portions of the Work for which such identification is required.
- 11.03 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder’s Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 11.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

ARTICLE 12—PREPARATION OF BID

- 12.01 The Bid Form is included with the Bidding Documents.
 - A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
 - B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”
- 12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

- 12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.
- 12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.
- 12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.
- 12.06 A Bid by an individual must show the Bidder's name and official address.
- 12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.
- 12.08 All names must be printed in ink below the signatures.
- 12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.
- 12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.
- 12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.
- 12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Lump Sum*

- A. Bidders must submit a Bid on a lump sum basis as set forth in the Bid Form.

13.02 *Unit Price*

- ~~A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.~~
- ~~B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.~~

- ~~C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.~~

13.03 Allowances

- A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 14—SUBMITTAL OF BID

- 14.01 The Bidding Documents **include two (2) separate bound copy of the Bid Form and one (1) flashdrive with digital copies of all bid documents**, and, if required, the Bid Bond Form. The unbound copies of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.
- 14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED – CHIPLEY LIBRARY BRANCH EXPANSION." A mailed Bid must be addressed to the location designated in the Advertisement.
- 14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

- 15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid,

and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

- 16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

- 18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.
- 18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.
- 18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.
- 18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.
- 18.05 *Evaluation of Bids*
- A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.
- 18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for

those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

- 18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 19—BONDS AND INSURANCE

- 19.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.
- 19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

- 20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

C-410

BID FORM FOR CONSTRUCTION CONTRACT

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to:

**Washington County Board of County Commissioners
Attn: Carol Underwood, Grants Specialist
1331 South Boulevard, Chipley, Florida 32428**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

1.03 **Scope of Services:** The Project includes the construction of three (3) additions to the existing Washington County Chipley Library Branch, located on the north, east, and west sides of the facility, with a combined area of approximately 5,400 square feet. Work generally consists of building construction with associated architectural, structural, mechanical, electrical, and plumbing systems, together with all required site improvements including demolition, grading, drainage, utilities, and restoration. All work shall be completed in accordance with the Contract Documents and coordinated with the existing facility to provide a fully operational library expansion.

1.04 Pursuant to F.S. 287.05701 the Owner will not consider social, political, or ideological interests in the contracting of this project.

ARTICLE 2—BASIS OF BID – LUMP SUM

2.01 Lump Sum Bids

A. The Bidder hereby proposes to complete the above services for a total lump sum cost of:

Total Bid in Figures

Total Bid in Words

Or

~~2.02 Unit Price Bids~~

~~A. Bidder will perform the following Work at the indicated unit prices provided in Attachment G:~~

~~B. Bidder acknowledges that:~~

~~1. Each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and~~

EJCDC® C-410, Bid Form for Construction Contract.

Copyright© 2018 National Society of Professional Engineers, American Council of Engineering Companies,
and American Society of Civil Engineers. All rights reserved.

C-410

- ~~2. Estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.~~

ARTICLE 3—ATTACHMENTS TO THIS BID

3.01 *The following documents are submitted with and made a condition of this Bid:*

- A. Bidder will perform the following Work at the indicated unit prices provided in Attachment G.
- B. Bidder Required Bid security;
- C. List of Proposed Subcontractors;
- D. List of Proposed Suppliers;
- E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
- F. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;
- G. Required Bidder Qualification Statement with supporting data;
- H. Completed Bid Form
- I. Bidders Checklist

ARTICLE 4—TIME OF COMPLETION

- 4.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 4.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 5—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

- A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *Instructions to Bidders*

- A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.03 *Receipt of Addenda*

- A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

C-410

ARTICLE 6—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS

6.01 Bidder’s Representations

- A. In submitting this Bid, Bidder represents the following:
1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
 2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
 4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
 5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
 6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder’s (Contractor’s) safety precautions and programs.
 7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
 8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
 9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
 10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

C-410

11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 Bidder's Certifications

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
 - a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
 - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
 - c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.
 - d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

C-410

BIDDER hereby submits this Bid as set forth above:

Bidder:

(typed or printed name of organization)

By:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

Address for giving notices:

Bidder's Contact:

Name:

(typed or printed)

Title:

(typed or printed)

Phone:

Email:

Address:

Bidder's Contractor License No.: (if applicable)

C-410

ATTACHMENT B LIST OF PROPOSED SUBCONTRACTORS

SUBCONTRACTOR LISTING

The Bidder has fully investigated each subcontractor listed and has in his files evidence that each subcontractor fully complies with the requirements of these specifications, has engaged successfully in his line of work for a reasonable period of time, that he maintains a fully equipped organization capable, technically and financially, of performing the work required, and that he made similar installations in a satisfactory manner.

<u>Name of Subcontractor</u>	<u>Description of Work</u>

C-410

ATTACHMENT C
LIST OF PROPOSED SUPPLIERS

EQUIPMENT AND MATERIAL LISTING

The Bidder will furnish the following items of equipment and materials:

<u>Name of Manufacturer</u>	<u>Description of Material and Equipment</u>

BID PROPOSAL SUMMARY

TOTAL BID PART A - NORTH, EAST, & WEST ADDITIONS	\$ _____
TOTAL BID PART B - SITE WORK	\$ _____
TOTAL BASE BID PARTS A + B	\$ _____

The project will be awarded as a lump sum contract. The quantities shown are engineer's estimates only, and it is the contractor's responsibility to review the documents, verify conditions, and include all work necessary to deliver a complete project in their bid. The Owner reserves the right to reject any or all bids, to waive minor informalities, and to award the contract in whole or in part, based on the Owner's determination of best interest and best value. Evaluation criteria may include contractor qualifications, relevant experience, past performance, proposed approach, location, and bid amount.

The Owner also reserves the right to negotiate and collaborate on value engineering solutions with the lowest responsible bidder to align the project scope with the established budget, without compromising quality or compliance.

Contractor's experience, qualifications, and track record will be considered as part of the selection process.

The Contractor shall maintain progress on schedule with all other projects currently under contract with the Owner or others, and ensure sufficient staffing, supervision, and coordination to meet project timelines.

Contractor shall furnish and install all materials, labor, equipment, and services necessary to deliver a complete, fully operational, and code-compliant system, including testing, startup, closeout, and certified as-built documentation.

The Contractor shall comply with the Florida Trench Safety Act (Chapter 553, Part III, Florida Statutes). For all trench excavations greater than five feet in depth, the Contractor must: Reference applicable OSHA trench safety standards (29 CFR 1926.650 Subpart P),

All contractors and subcontractors must comply with Florida Statute § 448.095 regarding E-Verify. The Contractor shall: Register with and utilize the E-Verify system to verify the employment eligibility of all new employees hired during the contract; Require all subcontractors to use E-Verify; Retain I-9 and E-Verify documentation for a minimum of three (3) years; Complete employment verification within three business days of new hires beginning work.

The Contractor is responsible for visiting the project site, reviewing existing conditions, and familiarizing themselves with the full scope of work. All work shall be completed in accordance with all applicable federal, state, and local codes, regulations, ordinances, and accepted industry standards.

The plans and specifications are intended to convey general design intent and performance criteria. They may not depict all details or site-specific conditions. It is the Contractor's responsibility to deliver a complete and functional system, regardless of whether each individual element is explicitly shown or described.

No additional compensation will be considered for failure to account for site conditions, omissions, or work that a qualified contractor should reasonably anticipate.

Item No.	Description	Unit	Quantity	Unit Price	Total Price
Part A: Building Additions for North, East, and West Wings					
A1	Mobilization and General Conditions and obtaining of required permits - may not exceed 15% of total bid amount.	LS	1		
A2	Performance and Payment Bonds - may not exceed 5% of total bid amount	LS	1		
A3	Building Addition Areas: Work shall include complete turnkey construction of the building addition, including all structural, architectural, mechanical, electrical, and plumbing systems, interior finishes, site improvements, utilities, and related work. Scope also includes required demolition, installation of specified furnishings, and all inspections, testing, commissioning, and closeout necessary to deliver a fully operational facility.				
A3.1	North Wing (975 SF±): Office Space	LS	1		
A3.2	East Wing (1,880 SF±): Children's Area	LS	1		
A3.3	West Wing (2,610 SF±): Assembly Area	LS	1		
A4	Contingency Allowance - to be used only upon written authorization.	LS	1		\$ 250,000.00
	TOTAL BID PART A				

Item No.	Description	Unit	Quantity	Unit Price	Total Price
Part B: Site Work					
A1	Mobilization and General Conditions and obtaining of required permits - may not exceed 15% of total bid amount.	LS	1		
A2	Performance and Payment Bonds - may not exceed 5% of total bid amount	LS	1		
A3	Erosion and Sediment Control	LS	1		
A4	As-Builts (PDF and CAD)	LS	1		
A5	Demolition of Existing Asphalt Pavement, Curb, Sidewalks, Landscaping, Utilities, Storm, ect.	LS	1		
A6	Site Earthwork (Excavation, grading, ect)	LS	1		
A7	Concrete Sidewalk, 4" Thick	SY	345		
A8	No. 57 Stone Gravel Infill (3" Thick) for Mech. Yard (Incl. landscape fabric)	SY	57		
A9	Modified Type F Curb	LF	95		
A10	Type B Stabilization (12" Thick, LBR 40)	SY	160		
A11	Optional Base Group 06 (8" Thick)	SY	160		
A12	SP-9.5 Asphalt Pavement (Traffic B, PG 76-22)	TN	25		
A13	Striping and Pavement Markings	LS	1		
A14	Storm Inlets, Drain Basin (24" Dia.)	EA	4		
A15	Storm Pipe, 15" Dia. (PP)	LF	361		
A16	Storm Pipe, 8" Dia. (HDPE)	LF	243		
A17	Mitered End Section, 15" Round, RCP	EA	2		
A18	Downspout Connections (Include piping, adapters, and fittings from 8" HDPE to downspouts)	EA	18		
A19	Sanitary Sewer Lateral, 4" PVC (Sch. 40)	LF	110		
A20	Sanitary Sewer Lateral, 6" PVC (Sch. 40)	LF	170		

Item No.	Description	Unit	Quantity	Unit Price	Total Price
Part B: Site Work					
A21	4" Sanitary Sewer Cleanout Assembly, F&I	EA	4		
A22	6" Sanitary Sewer Cleanout Assembly, F&I	EA	2		
A23	Water Service, 1.5" dia, (Include curb stop & fittings)	LS	42		
A24	Adjustment of Existing 1" Gas Line (Provide min cover)	LF	60		
A25	Performance Turf, Sod (Centipede)	SY	3110		
A26	Landscape Tree, Live Oak, F&I	EA	1		
A27	U-Style Bike Rack	EA	4		
A28	Contingency Allowance - to be used only upon written authorization.	LS	1		\$ 15,000.00
	TOTAL BID PART B				

C-430

BID BOND (PENAL SUM FORM)

Bidder Name: _____ Address (principal place of business): _____ _____	Surety Name: _____ Address (principal place of business): _____ _____
Owner Name: <u>Washington County B.O.C.C.</u> Address (principal place of business): <u>1331 South Boulevard</u> <u>Chipley, Florida 32428</u> _____	Bid Project (name and location): <u>Washington County</u> <u>Chipley Library Branch Expansion</u> _____ _____ Bid Due Date: _____
Bond Penal Sum: _____ Date of Bond: _____	
Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.	
Bidder _____ <i>(Full formal name of Bidder)</i>	Surety _____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature) (Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.	

C-430

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
 - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2. All Bids are rejected by Owner, or
 - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

SECTION C-440

CERTIFICATION BY BIDDER

This certification is required pursuant to Executive Order 11246 (30 F.R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.

NAME AND ADDRESS OF BIDDER (include ZIP Code):

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. Yes () No ()
2. Compliance reports were required to be filed in connection with such contract or subcontract. Yes () No ()
3. Bidder has filed all compliance reports due under applicable instructions, including SF 100. Yes () No ()
4. Have you ever been or are you being considered for sanction due to violation of Executive Order 112246, as amended? Yes () No ()

NAME AND TITLE OF SIGNER (Please Type):

(Signature)

(Date)

C-451

ARTICLE 1—GENERAL INFORMATION

1.01 Provide contact information for the Business:

Legal Name of Business:			
Corporate Office			
Name:		Phone number:	
Title:		Email address:	
Business address of corporate office:			
Local Office			
Name:		Phone number:	
Title:		Email address:	
Business address of local office:			

1.02 Provide information on the Business's organizational structure:

Form of Business:	☐ Sole Proprietorship ☐ Partnership ☐ Corporation		
☐ Limited Liability Company ☐ Joint Venture comprised of the following companies:			
1.			
2.			
3.			
Provide a separate Qualification Statement for each Joint Venturer.			
Date Business was formed:		State in which Business was formed:	
Is this Business authorized to operate in the Project location?		☐ Yes ☐ No ☐ Pending	

1.03 Provide information regarding the Business's officers, partners, and limits of authority.

Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	\$
Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	\$
Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	\$
Name:		Title:	

C-451

ARTICLE 2—LICENSING

2.01 Provide information regarding licensure for Business:

Name of License:			
Licensing Agency:			
License No:		Expiration Date:	
Name of License:			
Licensing Agency:			
License No:		Expiration Date:	

ARTICLE 3—DIVERSE BUSINESS CERTIFICATIONS

3.01 Provide information regarding Business's Diverse Business Certification, if any. Provide evidence of current certification.

Certification	Certifying Agency	Certification Date
☐ Disadvantaged Business Enterprise		
☐ Minority Business Enterprise		
☐ Woman-Owned Business Enterprise		
☐ Small Business Enterprise		
☐ Disabled Business Enterprise		
☐ Veteran-Owned Business Enterprise		
☐ Service-Disabled Veteran-Owned Business		
☐ HUBZone Business (Historically Underutilized) Business		
☐ Other		
☐ None		

ARTICLE 4—SAFETY

4.01 Provide Worker's Compensation Insurance Documentation.

Year	
Company	

C-451

**ARTICLE
FINANCIAL**

5—

- 5.01 Provide information regarding the Business's financial stability. Provide the most recent audited financial statement, and if such audited financial statement is not current, also provide the most current financial statement.

Financial Institution:			
Business address:			
Date of Business's most recent financial statement:		☐ Attached	
Date of Business's most recent audited financial statement:		☐ Attached	
Financial indicators from the most recent financial statement			
Contractor's Current Ratio (Current Assets ÷ Current Liabilities)			
Contractor's Quick Ratio ((Cash and Cash Equivalents + Accounts Receivable + Short Term Investments) ÷ Current Liabilities)			

ARTICLE 6—SURETY INFORMATION

- 6.01 Provide information regarding the surety company that will issue required bonds on behalf of the Business, including but not limited to performance and payment bonds.

Surety Name:			
Surety is a corporation organized and existing under the laws of the state of:			
Is surety authorized to provide surety bonds in the Project location?	☐ Yes ☐ No		
Is surety listed in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" published in Department Circular 570 (as amended) by the Bureau of the Fiscal Service, U.S. Department of the Treasury? ☐ Yes ☐ No			
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

C-451

ARTICLE 7—INSURANCE

- 7.01 Provide information regarding Business's insurance company(s), including but not limited to its Commercial General Liability carrier. Provide information for each provider.

Name of insurance provider, and type of policy (CLE, auto, etc.):			
Insurance Provider		Type of Policy (Coverage Provided)	
Are providers licensed or authorized to issue policies in the Project location?		☐ Yes ☐ No	
Does provider have an A.M. Best Rating of A-VII or better?		☐ Yes ☐ No	
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 8—CONSTRUCTION EXPERIENCE

- 8.01 Provide information that will identify the overall size and capacity of the Business.

Average number of current full-time employees:	
Estimate of revenue for the current year:	
Estimate of revenue for the previous year:	

- 8.02 Provide information regarding the Business's previous contracting experience.

Years of experience with projects like the proposed project:			
As a general contractor:		As a joint venturer:	
Has Business, or a predecessor in interest, or an affiliate identified in Paragraph 1.03:			
Been disqualified as a bidder by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No			
Been barred from contracting by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No			
Been released from a bid in the past 5 years? ☐ Yes ☐ No			
Defaulted on a project or failed to complete any contract awarded to it? ☐ Yes ☐ No			
Refused to construct or refused to provide materials defined in the contract documents or in a change order? ☐ Yes ☐ No			

C-451

Been a party to any currently pending litigation or arbitration? ☐ Yes ☐ No
Provide full details in a separate attachment if the response to any of these questions is Yes.

- 8.03 List at least three (3) projects currently under contract in Schedule A and provide indicated information.
- 8.04 List a minimum of three (3) and a maximum of six (6) projects completed in the last 5 years in Schedule B and provide indicated information to demonstrate the Business's experience with projects similar in type and cost of construction.
- 8.05 In Schedule C, provide information on key individuals whom Business intends to assign to the Project. Provide resumes for those individuals included in Schedule C. Key individuals include the Project Manager, Project Superintendent, Quality Manager, and Safety Manager. Resumes may be provided for Business's key leaders as well.

ARTICLE 9—REQUIRED ATTACHMENTS

- 9.01 Provide the following information with the Statement of Qualifications:
- A. If Business is a Joint Venture, separate Qualifications Statements for each Joint Venturer, as required in Paragraph 1.02.
 - B. Diverse Business Certifications if required by Paragraph 3.01.
 - C. Certification of Business's safety performance if required by Paragraph 4.02.
 - D. Financial statements as required by Paragraph 5.01.
 - E. Attachments providing additional information as required by Paragraph 8.02.
 - F. Schedule A (Current Projects) as required by Paragraph 8.03.
 - G. Schedule B (Previous Experience with Similar Projects) as required by Paragraph 8.04.
 - H. Schedule C (Key Individuals) and resumes for the key individuals listed, as required by Paragraph 8.05.
 - I. Additional items as pertinent.

C-451

This Statement of Qualifications is offered by:

Business:

(typed or printed name of organization)

By:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(date signed)

(If Business is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

C-451

Schedule A—Current Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

C-451

Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

C-451

Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

C-451

Schedule C—Key Individuals

Project Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Project Superintendent			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

C-451

Safety Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Quality Control Manager			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

C-470

SWORN STATEMENT UNDER FLORIDA STATUTE SECTION 287.133 (3) (A) ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Proposal, or Contract for _____.
2. This sworn statement is submitted by (entity), _____,

Whose business address is, _____, and
(if applicable) Federal Employer Identification Number (FEIN) is _____
(if the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement).

3. My name is _____ and my relationship to the entity named above is _____ (title).
4. I understand that a "public entity crime" as defined in paragraph 287.133(1) (g) Florida Statute, means 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 or with an agency or political subdivision of any other state or with the United States including, but not limited to , any bid or contract for goods or services to be provided to any public entity or any agency or public subdivision of any other state or of the United States and involved antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.
5. I understand that "convicted" or "convicted" as defined in paragraph 287.133 (1) (b), Florida Statutes, means 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 records 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 guilty or nolo contendere.
6. I understand that an "affiliate" as defined in Paragraph 287.133(1) (a), Florida Statutes, means:
 - a. A predecessor or successor of a person convicted of a public entity crime; or
 - b. 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. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one of shares constituting a controlling income among persons when not for fair interest in another person, or a pooling of equipment or income among persons when not for fair market value under a length agreement, shall be a prima facie case that one person controls another person. A person who knowingly convicted of a public entity crime, in Florida during the preceding 36 months shall be considered an affiliate.
7. I understand that a "person" as defined in paragraph 287.133 (1) (e), Florida Statutes, means any natural person or entity organized under the laws of the state or of the United States with the legal power to enter into a binding contract provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies)

- ☐ Neither the entity submitting this sworn statement, nor any officers, directors, executive, partners, shareholders, employees, member, or agents who are active in management of the entity, nor affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.
- ☐ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. (Please attach a copy of the final order)
- ☐ The person or affiliate was placed on the convicted BIDDER list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in public interest to remove the person or affiliate from the convicted BIDDER list. (Please attach a copy of the final order)
- ☐ The person or affiliate has not been placed on the convicted BIDDER list. (Please describe any action taken by, or pending with, the department of General Services)

I understand that the submission of this form to the contracting officer for the Public Entity identified in paragraph 4 above is for that Public Entity only, and that this form is valid through December 31 of the calendar year in which it is filed. I also understand that I am required to inform the Public Entity prior to entering a contract in excess of the threshold amount provided in Section 287.017, Florida Statutes, for category two of any change in the information contained in this form.

Signature

Date

STATE OF FLORIDA

COUNTY OF: _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority, who, after first being sworn by me, affixed his/her signature at the space provided above on this day of _____, 20____, and is personally known to me, or has provided _____ as identification.

Notary Public

My Commission expires: _____

C-474

Certification Regarding Labor Standards and Prevailing Wage

TO (Appropriate Recipient):

DATE:

c/o

PROJECT NUMBER (If any):

PROJECT NAME:

1. The undersigned, having executed a contract with _____
for the construction of the above-identified project, acknowledges that:
- a) The Labor Standards provisions are included in the aforesaid contract;
 - b) Correction of any infractions of the aforesaid conditions, including infractions by any of his subcontractors and any lower tier subcontractors, is his responsibility;

2. He certifies that:

- a) Neither he nor any firm, partnership or association in which he has substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5) or pursuant to Section 3(a) of the Davis-Bacon Act, as amended (40 U.S.C. 276a-2(a)).
- b) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designated as an ineligible contractor pursuant to any of the aforementioned regulatory or statutory provisions.

3. He agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by his subcontractors and any lower tier subcontractors, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements executed by the subcontractor.

4. He certifies that:

- a) The legal name and the business address of the undersigned are:

b) The undersigned is:

(1) A single proprietorship

(3) A corporation organized in the State of

(2) A partnership

(4) Other organization (Describe)

c) The name, title and address of the owner, partners or officers of the undersigned are:

Name

Title

Address

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

C-474

Certification Regarding Labor Standards and Prevailing Wage

-
- d) The names and addresses of all other persons , both natural and corporate, having a substantial interest in the undersigned, and the nature of the interest are *(if none, so state)*:

Name	Title	Address
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

-
- e) The names, addresses and trade classifications of all other building construction contractors in which the undersigned has a substantial interest are *(if none, so state)*:

Name	Title	Address
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

(Contractor)

Date _____

By _____

WARNING

U.S. Criminal Code, Section 1010, Title 18, U.S.C., provides in part: "Whoever, ... Makes, passes, utters, or publishes any statement, knowing the same to be false Shall be fined not more than \$5,000 or imprisoned not more than two years, or both.

C-480

**CERTIFICATION REGARDING DEBARMENT, SUSPENSION,
AND OTHER RESPONSIBILITY MATTERS PRIMARY COVERED TRANSACTIONS**

- (1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principal:
- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a 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;
 - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
 - (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- (2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Project Name

Bidder's Sam.gov #

Project Number

***Registration with Sam.gov
is a requirement for bidders
to be awarded the contract.***

Name

Title

Firm

Street Address

City, State, Zip

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

Lower Tier Covered Transactions

- (1) The prospective lower tier participant 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 prospective lower tier participant is unable to certify to the above statement, the prospective participant shall attach an explanation to this form.

Name

Local Government

Title

CDBG Contract Number

Firm

Street Address

City, State, Zip

Date

C-510

NOTICE OF AWARD

Date of Issuance:

Owner: **Washington County B.O.C.C.**

Owner's Project No.: **BB201**

Engineer: **David H. Melvin Inc.**

Engineer's Project No.: **WAS23LB**

Contract Name: **Washington County Chipley Library Branch Expansion**

Bidder:

Bidder's Address:

You are notified that Owner has accepted your Bid dated _____ for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

The Project includes the construction of three (3) additions to the existing Washington County Chipley Library Branch, located on the north, east, and west sides of the facility, with a combined area of approximately 5,400 square feet. Work generally consists of building construction with associated architectural, structural, mechanical, electrical, and plumbing systems, together with all required site improvements including demolition, grading, drainage, utilities, and restoration.

The Contract Price of the awarded Contract is \$ _____. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

3 unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award or has been transmitted or made available to Bidder electronically.

☐ Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner 3 counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited. Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: Washington County Board of County Commissioners

By (signature): _____

Name (printed): _____

Title: _____

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between Washington County Board of County Commissioners ("Owner") and _____ ("Contractor").

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

- 1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: **The Project includes the construction of three (3) additions to the existing Washington County Chipley Library Branch, located on the north, east, and west sides of the facility, with a combined area of approximately 5,400 square feet. Work generally consists of building construction with associated architectural, structural, mechanical, electrical, and plumbing systems, together with all required site improvements including demolition, grading, drainage, utilities, and restoration. All work shall be completed in accordance with the Contract Documents and coordinated with the existing facility to provide a fully operational library expansion.**

ARTICLE 2—THE PROJECT

- 2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Washington County Chipley Library Branch Expansion**

ARTICLE 3—ENGINEER

- 3.01 The Owner has retained **David H. Melvin, Inc.** ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.
- 3.02 The part of the Project that pertains to the Work has been designed by **David H. Melvin, Inc. along with DAG Architect, Inc. and Watford Engineering, Inc.**

ARTICLE 4—CONTRACT TIMES

- 4.01 *Time is of the Essence*
- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.
- 4.02 *Contract Times: Days*
- A. The Work will be substantially complete within **270** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **300** days after the date when the Contract Times commence to run.

C-520

4.05 Liquidated Damages

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
1. *Substantial Completion:* Contractor shall pay Owner **\$1,000.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
 2. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **\$500.00** for each day that expires after such time until the Work is completed and ready for final payment.
 4. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive, and will not be imposed concurrently.
- B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

4.06 Special Damages

- A. Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.
- B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.
- C. The special damages imposed in this paragraph are supplemental to any liquidated damages for delayed completion established in this Agreement.

C-520

ARTICLE 5—CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract a total lump sum of:

Lump Sum Contract Price \$_____

ARTICLE 6—PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the 5th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.
- a. **95%** percent of the value of the Work completed (with the balance being retainage).
- b. **95%** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to **100%** percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **200%** percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 *Consent of Surety*

- A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 *Interest*

- A. All amounts not paid when due will bear interest at the rate of **3.0%** percent per annum.

C-520

ARTICLE 7—CONTRACT DOCUMENTS

7.01 Contents

- A. The Contract Documents consist of all of the following:
1. This Agreement.
 2. Bonds:
 - a. Performance bond (together with power of attorney).
 - b. Payment bond (together with power of attorney).
 3. General Conditions.
 4. Supplementary Conditions.
 5. Specifications as listed in the table of contents of the project manual (copy of list attached).
 6. Drawings (not attached but incorporated by reference) consisting of _____ sheets with each sheet bearing the following general title: **Washington County Library – 1444 W. Jackson Avenue, Chipley, Florida 32428**
 7. Drawings listed on the attached sheet index.
 8. Addenda (numbers #_____ to #_____ inclusive).
 9. Exhibits to this Agreement (enumerated as follows):
 - a. **Southern Earth Sciences – Washington County Library Expansion Project (SESI Project No. P25-018)**
 10. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
 - d. Field Orders.
 - e. Warranty Bond, if any.
- B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 7.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 Contractor's Representations

- A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

C-520

1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

C-520

8.02 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:
1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

C-520

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

Owner:

Washington County B.O.C.C.

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name: David Pettis, Jr.

(typed or printed)

Title: Chair

(typed or printed)

Attest:

(individual's signature)

Title:

(typed or printed)

Address for giving notices:

1331 South Boulevard

Chipley, Florida 32428

Designated Representative:

Name: Carol Underwood

(typed or printed)

Title: Grants/Procurement Specialist

(typed or printed)

Address:

1331 South Boulevard

Chipley, Florida 32428

Phone: (850) 638-6058

Email: cunderwood@washingtonfl.com

(If [Type of Entity] is a corporation, attach evidence of authority to sign. If [Type of Entity] is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

Contractor:

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(typed or printed)

Title:

(typed or printed)

(If [Type of Entity] is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

(individual's signature)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

License No.:

(where applicable)

State:

C-521

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, _____, the duly authorized and acting
legal representative of _____ do hereby
certify as follows:

I have examined the attached contract(s) and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly authorized; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

Signature

Date

C-550

NOTICE TO PROCEED

Owner: Washington County B.O.C.C. Owner's Project No.: BB201
Engineer: David H. Melvin, Inc. Engineer's Project No.: WAS23LB
Contractor: _____ Contractor's Project No.: _____
Project: Washington County Chipley Library Branch Expansion
Contract Name: Washington County Chipley Library Branch Expansion
Effective Date of Contract: _____

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on _____ pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement:

The number of days to achieve Substantial Completion **270 days** from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of _____; and the number of days to achieve readiness for final payment is **300 days** from the commencement date of the Contract Times, resulting in a date for readiness for final payment of _____.

Before starting any Work at the Site, Contractor must comply with the following:

Paragraph 2.01 of the General Conditions provides that you and Owner must each deliver to the other (with copies to Engineer and other identified additional insureds and loss payees) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Owner: _____	Contractor _____
By (signature): _____	By (signature): _____
Name (printed): _____	Name (printed): _____
Title: _____	Title: _____
Date Issued: _____	Date Accepted: _____

Copy: Engineer

C-610

PERFORMANCE BOND

Contractor Name: _____ Address (principal place of business): _____ _____	Surety Name: _____ Address (principal place of business): _____ _____
Owner Name: Washington County B.O.C.C. Mailing address (principal place of business): 1331 South Boulevard Chipley, Florida 32428 _____ _____	Contract Description (name and location): Washington County Chipley Library Branch Expansion 1444 Jackson Avenue, Chipley, FL 32428 Contract Price: _____ Effective Date of Contract: _____
Bond Bond Amount: Date of Bond: <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: ☐ None ☐ See Paragraph 16	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
_____ <i>(Full formal name of Contractor)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i>	

C-610

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:
 - 3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;
 - 3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
 - 3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
 - 5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
 - 5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or
 - 5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

C-610

- 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
- 6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.
 - 7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
 - 7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
 - 7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
 - 8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
 - 9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
 - 10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
 - 11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.
 - 12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.
 - 13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such

C-610

statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

- 14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
 - 14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.
 - 14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.
 - 14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
 - 14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
16. Modifications to this Bond are as follows:

C-615

PAYMENT BOND

Contractor Name: _____ Address (principal place of business): _____ _____	Surety Name: _____ Address (principal place of business): _____ _____
Owner Name: <u>Washington County B.O.C.C.</u> Mailing address (principal place of business): <u>1331 South Boulevard</u> <u>Chipley, Florida 32428</u> _____ _____	Contract Description (name and location): <u>Washington County Chipley Library Branch Exp.</u> <u>1444 W. Jackson Ave, Chipley, FL 32428</u> _____ Contract Price: _____ Effective Date of Contract: _____
Bond Bond Amount: Date of Bond: (Date of Bond cannot be earlier than Effective Date of Contract) Modifications to this Bond form: ☐ None ☐ See Paragraph 18	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
_____ (Full formal name of Contractor)	_____ (Full formal name of Surety) (corporate seal)
By: _____ (Signature)	By: _____ (Signature)(Attach Power of Attorney)
Name: _____ (Printed or typed)	Name: _____ (Printed or typed)
Title: _____	Title: _____
Attest: _____ (Signature)	Attest: _____ (Signature)
Name: _____ (Printed or typed)	Name: _____ (Printed or typed)
Title: _____	Title: _____
Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.	

C-615

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond will arise after the following:
 - 5.1. Claimants who do not have a direct contract with the Contractor
 - 5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2. Pay or arrange for payment of any undisputed amounts.
 - 7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

C-615

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. Definitions
 - 16.1. *Claim*—A written statement by the Claimant including at a minimum:
 - 16.1.1. The name of the Claimant;
 - 16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;
 - 16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
 - 16.1.4. A brief description of the labor, materials, or equipment furnished;

C-615

- 16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- 16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
- 16.1.7. The total amount of previous payments received by the Claimant; and
- 16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
- 16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
- 16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
- 17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
- 18. Modifications to this Bond are as follows:



Contractor's Application for Payment No. _____

Application Period:		Application Date:
To (Owner):	From (Contractor):	Via (Engineer):
Project:	Contract:	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:

Application For Payment Change Order Summary

Approved Change Orders		
Number	Additions	Deductions
TOTALS		
NET CHANGE BY CHANGE ORDERS		

1. ORIGINAL CONTRACT PRICE..... \$ _____

2. Net change by Change Orders..... \$ _____

3. Current Contract Price (Line 1 ± 2)..... \$ _____

4. TOTAL COMPLETED AND STORED TO DATE
(Column F total on Progress Estimates)..... \$ _____

5. RETAINAGE:

a. X _____ Work Completed..... \$ _____

b. X _____ Stored Material..... \$ _____

c. Total Retainage (Line 5.a + Line 5.b)..... \$ _____

6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5.c)..... \$ _____

7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)..... \$ _____

8. AMOUNT DUE THIS APPLICATION..... \$ _____

9. BALANCE TO FINISH, PLUS RETAINAGE
(Column G total on Progress Estimates + Line 5.c above)..... \$ _____

1. ORIGINAL CONTRACT PRICE..... \$ _____

2. Net change by Change Orders..... \$ _____

3. Current Contract Price (Line 1 ± 2)..... \$ _____

4. TOTAL COMPLETED AND STORED TO DATE
(Column F total on Progress Estimates)..... \$ _____

5. RETAINAGE:

a. X _____ Work Completed..... \$ _____

b. X _____ Stored Material..... \$ _____

c. Total Retainage (Line 5.a + Line 5.b)..... \$ _____

6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5.c)..... \$ _____

7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)..... \$ _____

8. AMOUNT DUE THIS APPLICATION..... \$ _____

9. BALANCE TO FINISH, PLUS RETAINAGE
(Column G total on Progress Estimates + Line 5.c above)..... \$ _____

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:

(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;

(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all Liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such Liens, security interest, or encumbrances); and

(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor Signature

By:	Date:

Payment of: \$ _____
(Line 8 or other - attach explanation of the other amount)

is recommended by: _____ (Engineer) _____ (Date)

Payment of: \$ _____
(Line 8 or other - attach explanation of the other amount)

is approved by: _____ (Owner) _____ (Date)

Approved by: _____ (Funding or Financing Entity (if applicable)) _____ (Date)

Contractor's Application

EJCDC® C-620 Contractor's Application for Payment
© 2013 National Society of Professional Engineers for EJCDC. All rights reserved.
Page 2 of 12

Contractor's Application

EJCDC® C-620 Contractor's Application for Payment
© 2013 National Society of Professional Engineers for EJCDC. All rights reserved.
Page 3 of 12

Contractor's Application

EJCDC® C-620 Contractor's Application for Payment
© 2013 National Society of Professional Engineers for EJCDC. All rights reserved.
Page 4 of 12

C-625

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:

Engineer:

Contractor:

Project:

Contract Name:

Owner's Project No.:

Engineer's Project No.:

Contractor's Project No.:

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

Date of Substantial Completion:

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

C-625

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

The following documents are attached to and made a part of this Certificate:

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

CERTIFICATE OF FINAL COMPLETION

Owner:	Washington County	Owner's Contract No.:	BB201
Contractor:		Contractor's Project No.:	
Engineer:	David H. Melvin, Inc.	Engineer's Project No.:	WAS23LB
Project:	Washington County Chipley Library Branch Expansion Contract Name:		

This [preliminary] [final] Certificate of Final Completion applies to:

☐ All Work under the Contract Documents or to the following specified parts thereof:

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be complete in accordance with the Contract Documents on

Date of Final Completion

Notice to Proceed: _____ (DATE)

Notice Contract Time: _____ (CALENDAR DAYS)

Additional Contract Time
Approved by Change Order: _____ (CALENDAR
DAYS)

Total Approved Contract Time: _____ (CALENDAR
DAYS)

Actual Contract Time: _____ (CALENDAR DAYS)

Unapproved Construction Time: _____ (CALENDAR DAYS)

A warranty inspection will be held on: _____

The Warranty will expire on: _____

The following documents are attached to and made a part of this Certificate: _____

This certificate constitutes an acceptance of work in accordance with the Contract Documents. However, this certification shall not release the Contractor or its sureties from any obligations under the Contract Documents. The Performance Bond remains in full force and effect through the one (1) year warranty period.

EXECUTED BY ENGINEER:

RECEIVED:

RECEIVED:

By: _____ (Authorized signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

C-650

RELEASE OF LIEN

STATE OF FLORIDA

COUNTY OF FLORIDA _____

I, _____, having been first duly sworn, do now depose and say: That all person, firms, and corporations, who have furnished services, labor, or materials for use on the _____, Florida Department of Commerce Contract No. BB201, have fully completed their respective work, and it has been accepted by the Owner of said real estate; and there are no bills for labor or materials or appliances in connection with such construction which have not been paid.

Contractor's Representative

(SEAL)

Subscribed and sworn to before the undersigned, a Notary Public for the State of Florida, this _____ day of _____, 20____.

Notary Public

My commission expires _____.

C-700

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	Page
Article 1—Definitions and Terminology	1
1.01 Defined Terms	1
1.02 Terminology	6
Article 2—Preliminary Matters	7
2.01 Delivery of Performance and Payment Bonds; Evidence of Insurance	7
2.02 Copies of Documents	7
2.03 Before Starting Construction	7
2.04 Preconstruction Conference; Designation of Authorized Representatives	8
2.05 Acceptance of Schedules	8
2.06 Electronic Transmittals	8
Article 3—Contract Documents: Intent, Requirements, Reuse	9
3.01 Intent	9
3.02 Reference Standards	9
3.03 Reporting and Resolving Discrepancies	10
3.04 Requirements of the Contract Documents	10
3.05 Reuse of Documents	11
Article 4—Commencement and Progress of the Work	11
4.01 Commencement of Contract Times; Notice to Proceed	11
4.02 Starting the Work	11
4.03 Reference Points	11
4.04 Progress Schedule	12
4.05 Delays in Contractor's Progress	12
Article 5—Site; Subsurface and Physical Conditions; Hazardous Environmental Conditions	13
5.01 Availability of Lands	13
5.02 Use of Site and Other Areas	14
5.03 Subsurface and Physical Conditions	15
5.04 Differing Subsurface or Physical Conditions	16

5.05	Underground Facilities.....	17
5.06	Hazardous Environmental Conditions at Site	19
Article 6—Bonds and Insurance		21
6.01	Performance, Payment, and Other Bonds	21
6.02	Insurance—General Provisions.....	22
6.03	Contractor’s Insurance	24
6.04	Builder’s Risk and Other Property Insurance	25
6.05	Property Losses; Subrogation	25
6.06	Receipt and Application of Property Insurance Proceeds	27
Article 7—Contractor’s Responsibilities		27
7.01	Contractor’s Means and Methods of Construction	27
7.02	Supervision and Superintendence	27
7.03	Labor; Working Hours.....	27
7.04	Services, Materials, and Equipment	28
7.05	“Or Equals”	28
7.06	Substitutes	29
7.07	Concerning Subcontractors and Suppliers.....	31
7.08	Patent Fees and Royalties.....	32
7.09	Permits.....	33
7.10	Taxes.....	33
7.11	Laws and Regulations	33
7.12	Record Documents	33
7.13	Safety and Protection	34
7.14	Hazard Communication Programs.....	35
7.15	Emergencies.....	35
7.16	Submittals	35
7.17	Contractor’s General Warranty and Guarantee	38
7.18	Indemnification.....	39
7.19	Delegation of Professional Design Services	39
Article 8—Other Work at the Site		40
8.01	Other Work.....	40
8.02	Coordination	41
8.03	Legal Relationships	41

Article 9—Owner’s Responsibilities.....	42
9.01 Communications to Contractor	42
9.02 Replacement of Engineer.....	42
9.03 Furnish Data.....	42
9.04 Pay When Due	42
9.05 Lands and Easements; Reports, Tests, and Drawings	43
9.06 Insurance	43
9.07 Change Orders	43
9.08 Inspections, Tests, and Approvals.....	43
9.09 Limitations on Owner’s Responsibilities	43
9.10 Undisclosed Hazardous Environmental Condition.....	43
9.11 Evidence of Financial Arrangements	43
9.12 Safety Programs.....	43
Article 10—Engineer’s Status During Construction	44
10.01 Owner’s Representative	44
10.02 Visits to Site	44
10.03 Resident Project Representative	44
10.04 Engineer’s Authority	44
10.05 Determinations for Unit Price Work	45
10.06 Decisions on Requirements of Contract Documents and Acceptability of Work	45
10.07 Limitations on Engineer’s Authority and Responsibilities.....	45
10.08 Compliance with Safety Program	45
Article 11—Changes to the Contract.....	46
11.01 Amending and Supplementing the Contract	46
11.02 Change Orders	46
11.03 Work Change Directives.....	46
11.04 Field Orders	47
11.05 Owner-Authorized Changes in the Work.....	47
11.06 Unauthorized Changes in the Work.....	47
11.07 Change of Contract Price	47
11.08 Change of Contract Times.....	49
11.09 Change Proposals.....	49
11.10 Notification to Surety	50

Article 12—Claims	50
12.01 Claims	50
Article 13—Cost of the Work; Allowances; Unit Price Work	51
13.01 Cost of the Work	51
13.02 Allowances	55
13.03 Unit Price Work	55
Article 14—Tests and Inspections; Correction, Removal, or Acceptance of Defective Work	56
14.01 Access to Work	56
14.02 Tests, Inspections, and Approvals	56
14.03 Defective Work	57
14.04 Acceptance of Defective Work	58
14.05 Uncovering Work	58
14.06 Owner May Stop the Work	58
14.07 Owner May Correct Defective Work	59
Article 15—Payments to Contractor; Set-Offs; Completion; Correction Period	59
15.01 Progress Payments	59
15.02 Contractor’s Warranty of Title	62
15.03 Substantial Completion	62
15.04 Partial Use or Occupancy	63
15.05 Final Inspection	64
15.06 Final Payment	64
15.07 Waiver of Claims	65
15.08 Correction Period	66
Article 16—Suspension of Work and Termination	67
16.01 Owner May Suspend Work	67
16.02 Owner May Terminate for Cause	67
16.03 Owner May Terminate for Convenience	68
16.04 Contractor May Stop Work or Terminate	68
Article 17—Final Resolution of Disputes	69
17.01 Methods and Procedures	69
Article 18—Miscellaneous	69
18.01 Giving Notice	69
18.02 Computation of Times	69

18.03	Cumulative Remedies	70
18.04	Limitation of Damages	70
18.05	No Waiver	70
18.06	Survival of Obligations	70
18.07	Controlling Law	70
18.08	Assignment of Contract	70
18.09	Successors and Assigns	70
18.10	Headings	70

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

- requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.
- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
1. does not conform to the Contract Documents;
 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
 - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

- A. *Standards Specifications, Codes, Laws and Regulations*
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

- 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 - 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
 - C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
2. is of such a nature as to require a change in the Drawings or Specifications;
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
- a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. *Underground Facilities; Hazardous Environmental Conditions:* Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

- of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 - 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
 - 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
 - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and
5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur:* Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities:* Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 Substitutes

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
 2. *Samples*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

- d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
- 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
 - 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 - 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
 - 1. Observations by Engineer;
 - 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. Use or occupancy of the Work or any part thereof by Owner;
 - 5. Any review and approval of a Shop Drawing or Sample submittal;
 - 6. The issuance of a notice of acceptability by Engineer;
 - 7. The end of the correction period established in Paragraph 15.08;
 - 8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.

- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. An itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
 - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

B. If Owner has issued a Work Change Directive and:

1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit will be determined as follows:
1. A mutually acceptable fixed fee; or
 2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
 - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

- A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

- B. *Change Proposal Procedures*

- 1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
- 2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

- 3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
- 4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
 5. Other costs consisting of the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
 - 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
 - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.
- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work does not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
- 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 6. Expenses incurred in preparing and advancing Claims.
- 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

- 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
- 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances*: Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 Defective Work

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
 - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

- b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

- d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
 - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

C-800

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	Page
Article 1 - Definitions and Terminology.....	1
Article 2 - Preliminary Matters	1
Article 3 - Contract Documents: Intent, Requirements, Reuse	1
3.01 No suggested Supplementary Conditions in this Article.....	1
Article 4 - Commencement and Progress of the Work.....	1
Article 5 - Site, Subsurface and Physical Conditions, Hazardous Environmental Conditions.....	2
Article 6 - Bonds and Insurance.....	3
Article 7 - Contractor's Responsibilities.....	8
Article 8 - Other Work at the Site	8
Article 9 - Owner's Responsibilities	8
Article 10 - Engineer's Status During Construction	8
Article 11 - Changes to the Contract	10
Article 12 - Claims	10
Article 13 - Cost of Work; Allowances, Unit Price Work.....	10
No suggested Supplementary Conditions in this Article.....	10
Article 14 - Tests and Inspections; Correction, Removal, or Acceptance of Defective Work.....	10
Article 15 - Payments to Contractor, Set Offs; Completions; Correction Period	10
Article 16 - Suspension of Work and Termination	11
Article 17 - Final Resolutions of Disputes	11
Article 18 - Miscellaneous	11

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

1. DEFINITIONS AND TERMINOLOGY

No suggested Supplementary Conditions in this Article.

2. PRELIMINARY MATTERS

2.02 *Copies of Documents*

SC-2.02 Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor **up to three** printed copies of the Contract Documents (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional copies maybe requested to be purchased at cost.

3. CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 No suggested Supplementary Conditions in this Article.

4. COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractor's Progress*

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

5. *Weather-Related Delays*

- a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

5. SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.03 Subsurface and Physical Conditions

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

- E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
Refer to Construction Drawings	N/A	N/A

- F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
Refer to Construction Drawings	N/A	

5.06 Hazardous Environmental Conditions

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely: **[If there are no such reports, so indicate in the table]**

Report Title	Date of Report	Technical Data
Refer to Construction Drawings	N/A	N/A

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely: **[If there are no such drawings, so indicate in the table]**

Drawings Title	Date of Drawings	Technical Data
Refer to Construction Drawings	N/A	N/A

6. BONDS AND INSURANCE

6.01 Performance, Payment, and Other Bonds

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2010, 2013, or 2018 edition).
2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2010, 2013, or 2018 edition).

6.03 Contractor's Insurance

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

- D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds (in addition to Owner and Engineer) the following: **None**
- E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Employer's Liability	
Each accident	\$500,000.00
Each employee	\$500,000.00
Policy limit	\$500,000.00

- F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:
 1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
 2. damages insured by reasonably available personal injury liability coverage, and
 3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

- G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage.
 - a. Such insurance must be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
 4. Underground, explosion, and collapse coverage.
 5. Personal injury coverage.
 6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
 7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
 2. Any exclusion for water intrusion or water damage.
 3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
 4. Any exclusion of coverage relating to earth subsidence or movement.
 5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).
 6. Any limitation or exclusion based on the nature of Contractor's work.
 7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	Policy limits of not less than:
General Aggregate	\$2,000,000.00
Products—Completed Operations Aggregate	\$1,000,000.00
Personal and Advertising Injury	\$500,000.00
Bodily Injury and Property Damage—Each Occurrence	\$1,000,000.00

- J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	\$1,000,000.00
Each Accident	\$1,000,000.00
Property Damage	
Each Accident	\$1,000,000.00

- K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	\$1,000,000.00
General Aggregate	\$2,000,000.00

- L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of **\$1,000,000.00** after accounting for partial attribution of its limits to underlying policies, as allowed above.
- M. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	Policy limits of not less than:
Each Occurrence/Claim	N/A
General Aggregate	N/A

- N. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	\$1,000,000.00
Annual Aggregate	\$2,000,000.00

- O. *Railroad Protective Liability Insurance:* Prior to commencing any Work within 50 feet of railroad-owned and controlled property, Contractor shall (1) endorse its commercial general liability policy with ISO CG 24 17, removing the contractual liability exclusion for work within 50 feet of a railroad, (2) purchase and maintain railroad protective liability insurance meeting the following requirements, (3) furnish a copy of the endorsement to Owner, and (4) submit a copy of the railroad protective policy and other railroad-required documentation to the railroad, and notify Owner of such submittal.

Railroad Protective Liability Insurance	Policy limits of not less than:
Each Claim	N/A
Aggregate	N/A

- P. *Builder's Risk and Other Property Insurance*

1. Unless expressly waived by the Owner for underground utility or roadway projects, the Contractor shall purchase and maintain Builder's Risk insurance covering the Work. Such insurance shall be written on a completed value basis in an amount equal to 100 percent of the Contract Price and shall remain in effect until Substantial Completion or until Owner has accepted occupancy of the Work, whichever occurs first.
2. The policy shall be written on an "all-risk" or "special form" basis and shall insure against loss or damage to the Work, including fire, windstorm, theft, vandalism, malicious mischief, collapse, property in transit, and property stored off-site intended for use at the Project.
3. The Owner, Contractor, and all Subcontractors shall be named as insureds.

4. Contractor shall be responsible for any deductible amounts, which shall not exceed \$10,000 per loss without Owner's prior written approval.
5. Builder's Risk Insurance Policy limits of not less than:
 1. Completed Value of the Work (100% of Contract Price)
 2. Deductible: Not to exceed \$10,000, Contractor responsible
6. **Continuation of Coverage:** Coverage shall remain in effect until Substantial Completion of the entire Work and final acceptance by Owner, regardless of any partial occupancy or use by Owner.
7. **Covered Perils:** The Builder's Risk insurance shall include coverage for windstorm, flood, and earthquake, unless expressly waived in writing by Owner. Coverage shall also extend to loss or damage caused by theft, vandalism, collapse, malicious mischief, property in transit, and property stored off-site intended for use at the Project.
8. **Temporary Works and Testing:** The Builder's Risk insurance shall include coverage for temporary works, scaffolding, formwork, falsework, construction trailers, and similar items incidental to the Work. Coverage shall also apply to mechanical and electrical testing and startup of the building systems.
9. **Coinsurance / Subrogation:** The Builder's Risk policy shall not contain a coinsurance clause. Insurers shall waive all rights of subrogation against Owner, Contractor, Subcontractors, and Engineer.
10. **Change Orders:** The policy shall automatically adjust to reflect increases in the Contract Price by Change Order, without the need for additional endorsement.
11. **Soft Costs (if required by Owner):** The Builder's Risk policy shall include coverage for soft costs and extra expense associated with delay in completion caused by an insured loss, including but not limited to design professional fees, financing costs, and administrative costs, if expressly required in the Contract Documents.

Q. *Indemnification*

1. To the fullest extent permitted by law the Recipient's contractor shall indemnify and hold harmless the Recipient, the State of Florida, FloridaCommerce, and its officers and employees, from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness or intentional wrongful misconduct of contractor and persons employed or utilized by contractor in the performance of this Contract. This indemnification shall survive the termination of this Agreement. Nothing contained in this paragraph is intended to nor shall it constitute a waiver of the State of Florida and the Recipient's sovereign immunity. To the fullest extent permitted by law, the Recipient's consultant shall indemnify and hold harmless the Recipient, the State of Florida, FloridaCommerce, and its officers and employees from liabilities, damages, losses, and costs, including, but not limited to, reasonable attorney fees to the extent caused, in whole or in part, by the professional

negligence, error or omission, recklessness, or intentional wrongful conduct of the consultant or persons employed or utilized by the consultant in the performance of the Agreement. This indemnification shall survive the termination of this Agreement. Nothing contained in this paragraph is intended to nor shall it constitute a waiver of the State of Florida and the Recipient's sovereign immunity.

7. **CONTRACTOR'S RESPONSIBILITIES**

7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be **7:00 AM to 5:00 PM** from Monday – Friday.
2. Work outside of these hours must be approved by the Owner.

7.10 *Taxes*

SC-7.10 Add a new paragraph immediately after Paragraph 7.10.A:

- B. Owner is exempt from payment of sales and compensating use taxes of the State of **Florida** and of cities and counties thereof on all materials to be incorporated into the Work.
 1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.
 2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

8. **OTHER WORK AT THE SITE**

No suggested Supplementary Conditions in this Article.

9. **OWNER'S RESPONSIBILITIES**

No suggested Supplementary Conditions in this Article.

10. **ENGINEER'S STATUS DURING CONSTRUCTION**

10.03 *Resident Project Representative*

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

- C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:

1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
 2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.
 3. *Liaison*
 - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.
 4. *Review of Work; Defective Work*
 - a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Observe whether any Work in place appears to be defective.
 - c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.
 5. *Inspections and Tests*
 - a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
 - b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
 6. *Payment Requests:* Review Applications for Payment with Contractor in an advisory role. Contractor shall be responsible for accuracy of all pay requests.
 7. *Completion*
 - a. Participate in Engineer's visits regarding Substantial Completion.
 - b. Assist in the preparation of a punch list of items to be completed or corrected.
 - c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
 - d. Observe whether items on the final punch list have been completed or corrected.
- D. The RPR will not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including “or-equal” items).
2. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
7. Authorize Owner to occupy the Project in whole or in part.

11. CHANGES TO THE CONTRACT

No suggested Supplementary Conditions in this Article.

12. CLAIMS

No suggested Supplementary Conditions in this Article.

13. COST OF WORK; ALLOWANCES, UNIT PRICE WORK

No suggested Supplementary Conditions in this Article.

14. TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

No suggested Supplementary Conditions in this Article.

15. PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.03 Substantial Completion

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be borne by Contractor. Owner may deduct such costs directly from any progress payment then or thereafter due, including retainage, without the need for further agreement. If such costs exceed the remaining Contract balance, Contractor shall promptly reimburse Owner upon demand. Such reimbursement obligation shall survive termination or completion of the Contract.

16. SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

17. FINAL RESOLUTIONS OF DISPUTES

1. Any dispute between the parties arising out of or relating to the Contract Documents or the Work shall be resolved by a non-jury trial before a judge of the Fourteenth Judicial Circuit, sitting in and for Washington County, Florida. The parties expressly and mutually waive the right to trial by jury. Exclusive venue and jurisdiction for any such action shall lie solely in Washington County, Florida. This Contract shall be governed by and construed in accordance with the laws of the State of Florida, without regard to conflict of law principles..

18. MISCELLANEOUS

No suggested Supplementary Conditions in this Article.

C-940

WORK CHANGE DIRECTIVE NO.:

Owner: _____ Owner's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Contractor: _____ Contractor's Project No.: _____
Project: _____
Contract Name: _____
Date Issued: _____ Effective Date of Work Change Directive: _____

Contractor is directed to proceed promptly with the following change(s):

Description:

Attachments:

Purpose for the Work Change Directive:

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

☐ Non-agreement on pricing of proposed change. ☐ Necessity to proceed for schedule or other reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price: \$ _____ (increase / decrease)

Contract Time: _____ days (increase / decrease)

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price ☐ Cost of the Work ☐ Other

Recommended by Engineer

Authorized by Owner

By:

Title:

Date:

EJCDC® C-940, Work Change Directive.

Copyright© 2018 National Society of Professional Engineers, American Council of Engineering Companies,
and American Society of Civil Engineers. All rights reserved.

C-941

CHANGE ORDER NO.:

Owner: _____ Owner's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Contractor: _____ Contractor's Project No.: _____
Project: _____
Contract Name: _____
Date Issued: _____ Effective Date of Change Order: _____

The Contract is modified as follows upon execution of this Change Order:

Description:

Attachments:

Change in Contract Price	Change in Contract Times
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. ____: \$ _____	[Increase] [Decrease] from previously approved Change Orders No.1 to No. ____: Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: \$ _____	[Increase] [Decrease] this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

Recommended by Engineer (if required)

Accepted by Contractor

By: _____
Title: _____
Date: _____

Authorized by Owner

Approved by Funding Agency (if applicable)

By: _____
Title: _____
Date: _____

C-942

FIELD ORDER NO.:

Owner:

Engineer:

Contractor:

Project:

Contract Name:

Date Issued:

Owner's Project No.:

Engineer's Project No.:

Contractor's Project No.:

Effective Date of Field Order:

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

Attachments:

Issued by Engineer

By: _____

Title: _____

Date: _____

SECTION 01 CIVIL SPECIFICATIONS (DHM)

SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Contract description.
3. Contractor's use of Site and premises.
4. Future work.
5. Work sequence.
6. Owner's product Purchase contracts.
7. Work restrictions.
8. Owner occupancy.
9. Permits.
10. Specification conventions.

1.2 PROJECT INFORMATION

A. Name: WASHINGTON COUNTY PUBLIC LIBRARY.

1. Project Location: 1444 W. JACKSON AVENUE, CHIPLEY, FLORIDA 32428

B. Owner Municipality: WASHINGTON COUNTY BOARD OF COUNTY COMMISSIONERS

1. Owner's Representative: RENAE ROUNTREE, LIBRARY DIRECTOR

C. Project Engineer: DAVID H. MELVIN, INC.

1. Engineer's Representative: BRENT E. MELVIN, P.E.
- 2.

D. Web-Based Project Software: Project software will be used for purposes of managing communication and documents during the construction stage.

1. See Section 013216 - Construction Progress Schedule for requirements for using web-based Project software.

1.3 CONTRACT DESCRIPTION

- A. Work of the Project includes construction of three (3) additions to the existing Washington County Chipley Library Branch, located on the north, east, and west sides of the facility, with a combined area of approximately 5,400 square feet. Work generally consists of building construction with associated architectural, structural, mechanical, electrical, and plumbing systems, together with all required site improvements including demolition, grading, drainage, utilities, and restoration. All work shall be completed in accordance with the Contract Documents and coordinated with the existing facility to provide a fully operational library expansion.
- B. Perform Work of Contract under Stipulated Sum Contract with Owner according to Conditions of Contract.

1.4 OWNER-FURNISHED PRODUCTS

- A. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner-reviewed Shop Drawings, Product Data, and Samples to Contractor.
 - 2. Arrange and pay for delivery to Site.
 - 3. Upon delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor's Responsibilities:
 - 1. Review Owner-reviewed Shop Drawings, Product Data, and Samples.
 - 2. Receive and unload products at Site; inspect for completeness or damage jointly with Owner.
 - 3. Repair or replace items damaged after receipt.
 - 4. Handle, store, install, and finish products.

1.5 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Restricted Use of Site: 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. Limits on 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.

- C. Limits on Use of Site: Confine construction operations to indicated on Drawings .
 - 1. Limit use of Site and premises to allow:
 - a. Owner occupancy.
 - b. Use by the public
 - 2. Driveways, Walkways, and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on Site.
- D. Emergency Building Exits during Construction: Shall not be blocked and ingress/egress paths shall remain open at all times.
- E. Construction Operations: Limited to areas indicated on Drawings.
 - 1. Noisy and Disruptive Operations (such as Use of Jack Hammers and Other Noisy Equipment): Not allowed in close proximity to existing building during regular hours of operation. Coordinate and schedule such operations with Owner to minimize disruptions.
- F. Time Restrictions for Performing Interior and Exterior Work: Shall be coordinated with the Owner's Representative and the Engineer.
- G. Utility Outages and Shutdown:
 - 1. Coordinate and schedule electrical and other utility outages with Owner.
 - 2. Outages: Allow only at previously agreed upon times. Schedule outages at times when facility is not being used, or as otherwise agreed upon with Owner and Engineer.
 - 3. At least one week before scheduled outage, submit outage request plan to Architect/Engineer and Owner itemizing dates, times, and duration of each requested outage.
- H. Construction Plan: Before start of construction, submit a digital copy of construction plan regarding access to Work, use of Site, and utility outages for acceptance by Owner. After acceptance of plan, construction operations shall comply with accepted plan unless deviations are accepted by Owner in writing.

1.6 WORK SEQUENCE

- A. Construct Work in order to accommodate Owner's occupancy requirements within the existing building during construction period. Coordinate construction schedule and operations with Architect/Engineer and Owner:
- B. Sequencing of Construction Plan: Before start of construction, submit a digital copy copies of construction plan regarding phasing of demolition, and new Work for acceptance by Owner. After acceptance of plan, comply with accepted plan when coordinating construction sequencing unless deviations are accepted by Owner in writing.

1.7 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction (AHJ).
- B. On-Site Work Hours: Limit Work to between 7:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and AHJ.
 - 1. Weekend Hours: As approved by Owner and Engineer.
 - 2. Early Morning Hours: As approved by Owner and Engineer.
 - 3. Work in Existing Building: As approved by Owner and Engineer.
 - 4. Hours for Utility Shutdowns: As approved by Owner and Engineer.
- C. On-Site Work Day Restrictions: Do not perform Work resulting in utility shutdowns or resulting in noisy activity on Site during Work blackout days indicated by Owner.
- D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions, and only after arranging for temporary utility services according to requirements indicated:
 - 1. Notify Engineer and Owner not less than five business days in advance of proposed utility interruptions.
 - 2. Obtain Engineer's written permission before proceeding with utility interruptions.
- E. Noise, Vibration, Dust, and Odors: Coordinate with Owner operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy.
 - 1. Notify Engineer and Owner not less than five business days in advance of proposed utility interruptions.
 - 2. Obtain Engineer's written permission before proceeding with utility interruptions.

- F. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, marijuana and other controlled substances within existing building, on Project Site, on Owner's property is not permitted.
- G. Employee Identification: Provide identification tags for Contractor personnel working on Project Site. Require personnel to use identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project Site.
 - 1. Maintain list of approved screened personnel with Owner's representative.

1.8 OWNER OCCUPANCY

- A. Owner will occupy existing premises during entire period of construction.
- B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- C. Schedule Work to accommodate Owner occupancy.

1.9 PERMITS

- A. Furnish necessary permits for construction of Work, including but not limited the following:
 - 1. Building permit.
 - 2. Dewatering permit.

1.10 SPECIFICATION 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. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
 - 3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.

- B. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on 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. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings and published as part of the U.S. National CAD Standard.
 3. 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

- 3.1 All work shall be performed in strict accordance with the project plans and specifications, the Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction (Fiscal Year 2025-2026 Edition), all applicable requirements of the City of Chipley, Washington County, and all applicable state and federal codes, regulations, and requirements. It is the Contractor's responsibility to ensure full compliance with all governing authorities and regulatory agencies having jurisdiction over the work.

END OF SECTION

SECTION 01026

APPLICATIONS FOR PAYMENT

CONTRACTOR'S PREREQUEST

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

Submit Applications for Payment to the Engineer in accord with the schedule established by Conditions of the Contract and Agreement Between Owner and Contractor.

1.2 RELATED REQUIREMENTS

- A. Agreement Between Owner and Contractor.
- B. Conditions of the Contract: Progress Payments, Retainages and Final Payment.
- C. Section 01030: Measurement and Payment.
- D. Section 01700: Contract Close-out.
- E. Section 01720 : Project Record Documents.

1.3 FORMAT AND DATA REQUIRED

- A. Submit one application to the Engineer typed on forms provided by the Engineer, Application for Payment, with itemized data typed on 8-1/2 inch x 11 inch or 8-1/2 inch x 14 inch white paper continuation sheets.
- B. Fill in required information, including that for Change Orders executed prior to date of submittal of application.
- C. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.
- D. Execute certification with signature of a responsible officer of Contract firm.

1.4 PREREQUISITES FOR PAYMENTS

The Contractor shall provide the following as a prerequisite for payment.

- A. Exhibit the updated record drawings as required by Section 01720, Project Record Documents, for review by the Engineer.
- B. Submit required certificates and evidence of passing test for items for which payment is requested in accordance with the testing requirements in Section 01410, Testing Services.
- C. Submit payroll records indicating compliance with Federal Wage Requirements on Form WH347, if project is federally funded.
- D.
- D. Submit revised construction schedules in accordance with Section 01310, Construction Schedules.

1.5 SUBMITTAL AND PAYMENT PROCEDURE

A. Contractor's Responsibility

1. In order for progress payments be made to the Contractor, the Owner must request and receive the funds for each progress payment from the FloridaCommerce (FC). The process of requesting and receiving funds from FC requires approximately 45 days. In order to expedite payment to the Contractor, it is recommended that the Contractor notify the Engineer by phone 30 days prior of his intention to submit an Application for Payment and indicate the estimated funds to be requested. This will allow the Engineer to instruct the Owner to proceed with the request for funds from FC. This will help insure the immediate availability of funds upon the final approval of the actual Application for Payment.
2. Contractor shall satisfy all prerequisites prior to submittal of Application for Payment.
3. Contractor shall submit completed and signed Application for Payment to Engineer. Contractor may submit Application for Payment at any time, however, not more frequently than one per month.

B. Engineer's Responsibility

1. Inform Owner/Grant Administrator of Contractor's advance notice of intention to submit Application for Payment.
2. Review and make recommendation concerning Application for Payment to Owner.

C. Owner's Responsibility

1. Request funds from DCA, if required by grant agreement.
2. Approve Application for Payment.
3. Make a progress payment to the Contractor not later than five (5) days after Owner receives funds from FC on the basis of a duly certified and approved Application for Payment for the work performed during the preceding interim, but to insure the proper performance of this Contract, the Owner shall retain five percent (5%) of the amount of each estimate until final completion and acceptance of all work covered by this Contract.

PART 2 - PRODUCT

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Provide and pay for field engineering services for work.
1. Survey work required in execution of work.
 2. Civil, structural, or other professional engineering services specified, or required to execute Contractor's construction methods.
 3. The method of field staking for the construction of the work shall be at the option of the Contractor. The Owner shall provide engineering surveys to establish reference points which in his judgment are necessary to enable the Contractor to proceed with his work.
 4. The accuracy of any method of staking shall be the responsibility of the Contractor. All engineering for vertical and horizontal control shall be the responsibility of the Contractor.
- B. The Contractor shall retain the services of a registered land surveyor licensed in the State of Florida to identify existing control points and maintain a survey during construction. Verify all existing structure locations and all proposed building corner locations, tank locations, equipment locations, and roadway locations.

1.2 QUALIFICATIONS OF SURVEYOR OR ENGINEER

- A. Qualified engineer or registered land surveyor, acceptable to the Owner and the Engineer.
- B. Registered professional engineer of the discipline required for the specific service on the Project, currently licensed in the State of Florida.

1.3 SURVEY REFERENCE POINTS

- A. Locate and protect control points prior to starting site work and preserve all permanent reference points during construction.
1. Make no changes or relocations without prior written notice to the Engineer.
 2. Report to the Engineer when any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.
 3. Require surveyor to replace control points which may be lost or destroyed at no additional cost to the Owner.
 - a. Establish replacements based on original survey control.

1.4 PROJECT SURVEY REQUIREMENTS

- A. Establish a permanent benchmark onsite, referenced to data established by survey control points.
 - 1. Record location, with horizontal and vertical data, on Record Documents.
- B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:
 - 1. Site improvements.
 - a. Stakes for grading, fill and topsoil replacement.
 - b. Utility slopes and invert elevations.
 - 2. Batter boards for structure.
 - 3. Building foundation, column locations and floor levels.
 - 4. Controlling lines and levels required for mechanical and electrical trades.
- C. From time to time, verify layouts by same methods.
- D. Establish all lines and grades prior to construction of line work for all force mains, water mains and transmission mains at 100 to 200 feet increments.

1.5 RECORDS

- A. Maintain a complete, accurate log of all control and survey work as it progresses.
- B. At Contract closeout submit a certified site survey at 1"=50' scale on a reproducible tracing sheet 24" x 36", indicating the building corners and location of all structures.
- C. At Contract closeout submit a certified survey at the same scale as the Engineer's line drawings indicating elevations and stationing at 100 feet increments and at all valve and fitting locations.

1.6 SUBMITTALS

- A. Submit name and address of surveyor and professional engineer to the Engineer.
- B. On request of the Engineer, submit documentation to verify accuracy of field engineering work.
- C. Submit certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.
- D. Submit drawings showing locations of all structures constructed. This drawing shall be included with the Record Documents.

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Promptly after award of the Contract and within ten days after the effective date of the Agreement, prepare and submit to the Engineer estimated construction progress schedules for the work, with sub-schedules of related activities which are essential to its progress.
- B. Submit revised progress schedules on a monthly basis.
- C. No partial payments shall be approved by the Engineer until there is an approved construction progress schedule on hand.
- D. The Contractor shall designate an authorized representative of his firm who shall be responsible for development and maintenance of the schedule and of progress and payment reports. This representative of the Contractor shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the commitments of the Contractor's schedule.

1.2 RELATED REQUIREMENTS

- A. Conditions of the Contract.
- B. Section 01010: Summary of Work.

1.3 FORM OF SCHEDULES

- A. Prepare schedules in the form of a horizontal bar chart.
 - 1. Provide separate horizontal bar for each trade or operation within each structure or item.
 - 2. Horizontal time scale: In weeks from start of construction and identify the first workday of each month.
 - 3. Scale and spacing: To allow space for notations and future revisions.
 - 4. Minimum sheet size: 8-1/2 inches x 14 inches.
- B. Format of listings: The chronological order of the start of each item of work for each structure.
- C. Identification of listings: By major specification section numbers as applicable and structure.

1.4 CONTENT OF SCHEDULES

- A. Construction Progress Schedule:
 - 1. Show the complete sequence of construction by activity.

2. Show the dates for the beginning of, and completion of, each major element of construction in no more than a two-week increment scale. Specifically list, but not limited to:

- a. Site clearing.
- b. Site utilities.
- c. Foundation work.
- d. Structural framing.
- e. Subcontractor work.
- f. Equipment installations.
- g. Finishings.
- h. Instrumentation.
- i. Painting.
- j. Schooling.
- k. Testing.
- l. Start-up.
- m. Receipt of spare parts.
- n. Pipe installation.
- o. Boring and jacking.
- p. Restoration.

3. Show projected percentage of completion for each item, as of the first day of each month.

4. Show projected dollar cash flow requirements for each month of construction.

B. Submittals Schedule for Shop Drawings, and Samples in accordance with Section 01340. Show:

1. The dates for Contractor's submittals.
2. The dates submittals will be required for owner-furnished products, if applicable.
3. The dates approved submittals will be required from the Engineer.

C. A typewritten list of all long-lead items (equipment, materials, etc.).

1.5 PROGRESS REVISIONS

A. Indicate progress of each activity to date of submission.

B. Show changes occurring since previous submission of schedule:

1. Major changes in scope.
2. Activities modified since previous submission.
3. Revised projections of progress and completion.
4. Other identifiable changes.

C. Provide a narrative report as needed to define:

1. Problem areas, anticipated delays, and the impact on the schedule.
2. Corrective action recommended, and its effect.
3. The effect of changes on schedules of other prime Contractors.

1.6 SUBMISSIONS

A. Submit initial schedules to the Engineer within 10 days after the effective date of the Agreement.

1. The Engineer will review schedules and return review copy within 21 days after receipt.
2. If required, resubmit within 7 days after return of review copy.

B. Submit revised monthly progress schedules with that month's application for payment.

C. Submit one copy.

1.7 DISTRIBUTION

A. Distribute copies of the revised schedules to:

1. Engineer.
2. Job site file.
3. Subcontractors.
4. Other concerned parties.
5. Owner (two copies).

B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01340

SHOP DRAWINGS, WORKING DRAWINGS, AND SAMPLES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. The Contractor shall submit to the Engineer for review and exception, if any, such working drawings, shop drawings, test reports and data on materials and equipment (hereinafter in this article called data), and material samples (hereinafter in this article called samples) as are required for the proper control of work, including but not limited to those working drawings, shop drawings, data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.

B. Within thirty (30) calendar days after the effective date of the Agreement, the Contractor shall submit to the Engineer a complete list of preliminary data on items for which shop drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the Engineer shall in no way expressed or implied relieve the Contractor from submitting complete shop drawings and providing materials, equipment, etc., fully in accordance with the Specifications. This procedure is required in order to expedite final review of shop drawings.

C. The Contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the Owner and the Engineer. This log should include the following items:

1. Submittal-Description and Number assigned.
2. Date to Engineer.
3. Date returned to Contractor (from Engineer).
4. Status of Submittal (Approved/Resubmit/Rejected).
5. Date of Resubmittal and Return (as applicable).
6. Date material released (for fabrication).
7. Projected date of fabrication.
8. Projected date of delivery to site.
9. Status of O&M submittal.

D. Shop drawings to be submitted shall include but not necessarily be limited to:

1. Concrete design mix(es);
2. Each item of equipment and/or material listed in the equipment and material schedule;
3. Each item of process instrumentation and control system including system schematic diagrams;
4. Prestressed and precast concrete members;
5. Reinforcing steel;
6. Structural steel fabrications;
7. Miscellaneous metals fabrications and castings;
8. Paintings and coatings system;
9. Electrical fixtures hardware and panels;
10. Piping and duct work, layout and dimension drawings.

1.2 RELATED REQUIREMENTS

- A. Section 00700: Standard General Conditions of the Construction Contract.
- B. Section 01310: Construction Schedules.
- C. Section 01720: Project Record Documents.
- D. Section 01730: Operating and Maintenance Data.
- E. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that the reviewed shop drawings, working drawings and samples will be needed.

1.3 CONTRACTOR'S RESPONSIBILITY

- A. It is the duty of the Contractor to check all drawings, data and samples prepared by or for him before submitting them to the Engineer for review. Each and every copy of the drawings and data shall bear Contractor's stamp showing that they have been so checked. Shop drawings submitted to the Engineer without the Contractor's stamp will be returned to the Contractor for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar data.
 - 4. Conformance with Specifications.
- C. The Contractor shall furnish the Engineer a schedule of shop drawing submittals fixing the respective dates for the submission of shop and working drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.
- D. The Contractor shall not begin any of the work covered by a drawing, data, or a sample returned for correction until a revision or correction thereof has been reviewed and returned to him, by the Engineer, approved.
- E. The Contractor shall submit to the Engineer all drawings and schedules sufficiently in advance of construction requirements to provide no less than twenty-one (21) calendar days for checking and appropriate action from the time the Engineer receives them.
- F. The Contractor shall submit two (2) copies of descriptive or product data submittals to complement shop drawings for the Engineer plus the number of copies which the Contractor requires. The Engineer will retain two (2) sets.

G. The Contractor shall clearly delineate each variation from the Contract Specifications and Drawings within a shop drawing submittal and request a deviation from the Contract Documents. Contractor shall clearly state why such a variation is requested. Request for variance and its documentation shall be noted in and attached to the Contractor's Letter of Transmittal of the shop drawing to be considered.

H. The Contractor shall be responsible for and bear all cost of damages which may result from the ordering of any material or from proceeding with any part of work prior to the review by the Engineer or the necessary shop drawings.

1.4 ENGINEER'S REVIEW OF SHOP DRAWINGS

A. The Engineer's review of drawings, data and samples submitted by the Contractor will cover only general conformity to the Specifications, external connections, and dimensions which affect the installation. The Engineer's review and exception, if any, will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown.

B. The review of drawings and schedules will be general, and shall not be construed:

1. as permitting any departure from the Contract requirements;
2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.

C. If the drawings or schedules as submitted describe variations per subparagraph 1.5.D. and show a departure from the Contract requirements which the Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Engineer may return the reviewed drawings without noting an exception.

D. When reviewed by the Engineer, each of the shop drawings will be identified as having received such review being so stamped and dated. Shop drawings stamped "REJECTED" and with required corrections shown will be returned to the Contractor for correction and resubmittal.

E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing or on resubmitted shop drawings, to revisions other than the corrections requested by the Engineer on previous submissions. The Contractor shall make any corrections required by the Engineer.

F. If the Contractor considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the Contractor shall give written notice thereof to the Engineer.

G. The Engineer will review a submittal/resubmittal a maximum of three (3) times after which cost of review will be borne by the Contractor. The cost of engineering shall be equal to the Engineer's charges to the Owner under the terms of the Engineer's agreement with the Owner.

H. When the shop drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

I. No partial submittals will be reviewed. Submittals not complete will be returned to the Contractor and will be considered "REJECTED" until resubmitted.

1.5 SHOP DRAWINGS

A. When used in the Contract Documents, the term "shop drawings" shall be considered to mean Contractor's plans for material and equipment which become an integral part of the Project. These drawings shall be complete and detailed. Shop drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature, and performance and test data, shall be considered only as supportive to required shop drawings as defined above.

B. Drawings and schedules shall be checked and coordinated with the work of all trades involved, before they are submitted for review by the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.

C. Each shop drawing shall have a blank area 3-1/2 inches by 3-1/2 inches, located adjacent to the title block. The title block shall display the following:

1. Number and title of the drawing.
2. Date of drawing or revision.
3. Name of project building or facility.
4. Name of contractor and subcontractor submitting drawing.
5. Clear identification of contents and location of the work.
6. Specification title and number.

D. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed.

E. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog references, size, finish and all other pertinent data.

F. All data submitted to the Engineer for approval shall be completely legible and shall clearly delineate items for which approval is sought; strike out or otherwise obliterate those items which are not applicable to this specific project.

G. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, and address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained. In addition, a maintenance and lubrication schedule for each piece of equipment shall be submitted along with each shop drawing submittal. This schedule shall be in the tablet form.

H. All manufacturers or equipment suppliers who propose to furnish equipment or products under Divisions 11, 12, 13, 14, 15 and 16 shall submit an installation list to the Engineer along with the required shop drawings. The installation list shall include at least five installations where identical equipment has been installed and has been in operation for a period of at least one (1) year.

I. Only the Engineer will utilize the color "red" in marking shop drawing submittals.

J. Before final payment is made, the Contractor shall furnish to Engineer two (2) sets of record shop drawings all clearly revised, complete and up to date showing the permanent construction as actually made for all reinforcing and structural steel, miscellaneous metals, process and mechanical equipment, yard piping, electrical system and instrumentation system.

1.6 WORKING DRAWINGS

A. When used in the Contract Documents, the term "working drawings" shall be considered to mean the Contractor's plans for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and falsework; for underpinning; and for such other work as may be required for construction but does not become an integral part of the Project.

B. Copies of working drawings as noted in subparagraph 1.6.A. above, shall be submitted to the Engineer where required by the Contract Documents or requested by the Engineer, and shall be submitted at least thirty (30) calendar days (unless otherwise specified by the Engineer) in advance of their being required for work.

C. Working drawings shall be signed by a registered Professional Engineer, currently licensed to practice in the State of Florida and shall convey, or be accompanied by, calculation or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Prior to commencing such work, working drawings must have been reviewed without specific exceptions by the Engineer, which review will be for general conformance and will not relieve the Contractor in any way from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error are assumed by the Contractor; the Owner and Engineer shall have no responsibility therefor.

1.7 SAMPLES

A. The Contractor shall furnish, for the approval of the Engineer, samples required by the Contract Documents or requested by the Engineer. Samples shall be delivered to the Engineer as specified or directed. The Contractor shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the Engineer.

B. Samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.
3. A minimum of two samples of each item shall be submitted.

C. Each sample shall have a label indicating:

1. Name of Project.
2. Name of Contractor and Subcontractor.
3. Material or Equipment Represented.
4. Place of Origin.
5. Name of Producer and Brand (if any).
6. Location of Project.

(Samples of finished materials shall have additional markings that will identify them under the finished schedules.)

D. The Contractor shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required in subparagraph 1.7.B. above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the Engineer. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.

E. Approved samples not destroyed in testing shall be sent to the Engineer or stored at the site of the work. Approved samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the approved samples. Samples which failed testing or were not approved will be returned to the Contractor at his expense, if so requested at time of submission.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01410

TESTING AND TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. The Contractor shall arrange for, schedule, provide and pay for the test called for in the specifications.
- B. The test shall be performed by an independent certified testing laboratory approved by the Engineer.
- C. The Contractor shall submit the name and evidence of certification of the testing laboratory prior to start of construction.
- D. The type, number and frequency of tests set forth in the appropriate Sections herein represent the minimum number of passing tests. Tests which indicate non-compliance (i.e., failing test) do not count towards the minimum number required. The Contractor may test the work in excess of the minimums and as necessary to assure himself the work complies with the specifications. The minimum type, number and frequency of tests shall be conducted.
- E. When test results indicate non-compliance with the specifications, the Contractor shall take additional tests to determine if deficiencies have been corrected. The type, number and scheduling of tests so ordered shall be determined by the Engineer. The Contractor shall provide and pay for these additional tests.
- F. The Engineer shall be furnished results of all tests conducted. Test results shall be mailed directly from the testing laboratory to the Engineer. The test shall be signed and sealed by a Registered Professional Engineer registered in the State of Florida. Such tests results shall be submitted to the Engineer prior to the Engineer's approval of Contractor's pay request that request payment for such items that require testing.
- G. Prior to final completion, the Contractor shall submit to the Engineer a statement indicating that all work performed as a part of this Contract is in accordance with the plans and specifications or noting any deviation thereof.

1.2 RELATED REQUIREMENTS

- A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
- B. Respective sections of specifications: Certification of products.
- C. Each specification section listed: Laboratory tests required, and standards for testing.
- D. Testing Laboratory inspection, sampling and testing is required as outline in the specifications.

1.3 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

- A. Laboratory is not authorized to:
 - 1. Release, revoke, alter or enlarge on requirements of Contract Documents.
 - 2. Approve or accept any portion of the Work.
 - 3. Perform any duties of the Contractor.

1.4 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with Laboratory personnel, provide access to Work, to Manufacturer's operations.
- B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes which require control by the testing laboratory.
- D. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. The Engineer may require the Contractor to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents.
- E. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, with the cost having been included in the item for which the testing is associated, and no extra charge to the Owner shall be allowed on account of such testing and certification.
- F. Furnish incidental labor and facilities:
 - 1. To provide access to Work to be tested.
 - 2. To obtain and handle samples at the Project site or at the source of the product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. For storage and curing of test samples.
- G. Notify Laboratory and Engineer sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01580

PROJECT IDENTIFICATION SIGN

PART 1 - GENERAL

1.1 REQUIREMENTS

- A. Contractor shall furnish, install and maintain a 2' x 3' project identification sign.
- B. The sign shall remain in place and become the property of the owner upon completion of construction.
- C. The sign shall be complete and properly installed no later than 20 days beyond the date of notice to proceed.
- D. The engineer shall furnish contractor with lettering information for the sign.

PART 2 - PRODUCTS

2.1 SIGN MATERIALS

- A. Structure and Framing: Shall be new pressure treated wood, in sound condition structurally adequate to work and suitable for specified finish. The sign shall be supported by 4" x 4" posts with a 2" x 4" frame.
- B. Sign Surfaces: 6mm thick poly metal material – aluminum skin over a polyethylene core
- C. Rough Hardware and Nails: Galvanized.

PART 3 - EXECUTION

3.1 PROJECT IDENTIFICATION SIGN

- A. Contractor shall construct project sign as shown on the drawings or as described herein.
- B. Erect signs in the numbers and locations stated below, in areas at high public visibility, as approved by the Engineer and Owner.

3.2 MAINTENANCE

Maintain signs and supports in a neat, clean condition; repair damages to structure, framing or sign.

3.3 REMOVAL

Contractor shall not remove signs. Sign shall become property of the owner.

END OF SECTION

SECTION 01700

CONTRACT CLOSE-OUT

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

Comply with requirements stated in Conditions of the Contract and in Specifications for administrative procedures in closing out the Work.

1.2 RELATED REQUIREMENTS

- A. Conditions of the Contract. Fiscal provisions, legal submittals and additional administrative requirements.
- B. Section 01720 : Project Record Documents.
- C. Section 01730: Operating and Maintenance Data.
- D. Section 01740 and/or Section 01742: Warranties and Bonds.
- E. The respective sections of Specification: Close-out Submittals Required of Trades.

1.3 SUBSTANTIAL COMPLETION

- A. When Contractor considers the Work is substantially complete, he shall submit to the Engineer:
 - 1. A written notice that the Work, or designated portion thereof, is ready for a substantial completion inspection.
 - 2. A list of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, the Engineer will make an inspection to determine the status of completion.
- C. Should the Engineer determine that the Work is not substantially complete:
 - 1. The Engineer will promptly notify the Contractor, in writing, giving the reasons therefor.
 - 2. Contractor shall remedy the deficiencies in the Work and send a second written notice of substantial completion to the Engineer.
 - 3. The Engineer will reinspect the Work.

D. When the Engineer finds that the Work is substantially complete, he will:

1. Prepare and deliver to Owner a tentative Certificate of Substantial Completion found in Section 00640, with a tentative list "punch list" of items to be completed or corrected before final payment.
2. After consideration of any objections made by the Owner as provided in Conditions of the Contract, and when the Engineer considers the Work substantially complete, he will execute and deliver to the Owner and the Contractor a definite Certificate of Substantial Completion with a revised punch list of items to be completed or corrected.

1.4 FINAL INSPECTION

A. When Contractor considers the Work is complete, he shall submit written certification that:

1. Contract Documents have been reviewed.
2. Work has been inspected for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents.
4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
5. Work is completed and ready for final inspection.

B. The Engineer will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.

C. Should the Engineer consider that the Work is incomplete or defective:

1. The Engineer will promptly notify the Contractor, in writing, listing the incomplete or defective Work.
2. Contractor shall take immediate steps to remedy the stated deficiencies and send a second written certification to the Engineer that the Work is complete.
3. The Engineer will reinspect the Work.

D. When the Engineer finds that the Work is acceptable under the Contract Documents, he shall request the Contractor to make close-out submittals.

1.5 REINSPECTION FEES

A. Should the Engineer perform reinspections due to failure of the Work to comply with the claims of status of completion made by the Contractor:

1. Owner will compensate the Engineer for such additional services.
2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

1.6 CONTRACTOR'S CLOSE-OUT SUBMITTALS TO ENGINEER

A. Evidence of compliance with requirements of governing authorities.

B. Project Record Documents: To requirements of Section 01720.

C. Operating and Maintenance Data, Instructions to Owner's Personnel: To requirements of Section 01730.

D. Warranties and Bonds: To requirements of Section 01740 and Section 01742.

- E. Keys and Keying Schedule.
- F. Spare Parts and Maintenance Materials: To requirements of Section 01730.
- G. Evidence of Payment and Release of Liens: To requirements of General and Supplementary Conditions.
- H. Certificate of Insurance for Products and Completed Operations.

1.7 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the Engineer.
- B. Statement shall reflect all adjustments to the Contract Sum:
 - 1. The original Contract Sum.
 - 2. Additions and deductions resulting from:
 - a. Previous Change Orders.
 - b. Allowances.
 - c. Unit Prices.
 - d. Deductions for uncorrected Work.
 - e. Penalties and Bonuses.
 - f. Deductions for liquidated damages.
 - g. Deductions for reinspection payments.
 - h. Other adjustments.
 - 3. Total Contract Sum, as adjusted.
 - 4. Previous payments.
 - 5. Sum remaining due.
- C. Engineer will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.8 FINAL APPLICATION FOR PAYMENT

Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Maintain at the site for the Owner one record copy of:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.
 - 5. Engineer's Field Orders or written instructions.
 - 6. Approved Shop Drawings, Working Drawings and Samples.
 - 7. Field Test records.
 - 8. Construction photographs.

1.2 RELATED REQUIREMENTS

- A. Section 01340: Shop Drawings, Working Drawings and Samples.

1.3 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents and samples in Contractor's field office apart from documents used for construction.
 - 1. Provide files and racks for storage of documents.
 - 2. Provide locked cabinet or secure storage space for storage of samples.
- B. File documents and samples in accordance with CSI/CSC format.
- C. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- D. Make documents and samples available at all times for inspection by the Engineer.
- E. As a prerequisite for monthly progress payments, the Contractor is to exhibit the currently updated "record documents" for review by the Engineer and the Owner.

1.4 MARKING DEVICES

- A. Provide felt tip marking pens for recording information in the color code designated by the Engineer.

1.5 RECORDING

- A. Label each document "PROJECT RECORD" in neat large printed letters.
- B. Record information concurrently with construction progress.
 - 1. Do not conceal any work until required information is recorded.
- C. Record Drawings ("As-Built"):
 - 1. Depths of various elements of foundation in relation to finish first floor datum.
 - 2. All underground piping with elevations and dimensions. Changes in piping location. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Actual installed pipe material, class, etc.
 - 3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 - 4. Field changes of dimension and detail.
 - 5. Changes made by Field Order or by Change Order.
 - 6. Details not on original Contract drawings.
 - 7. Equipment and piping relocations.
 - 8. Major architectural and structural changes including relocation of doors, windows, etc.

A complete set of record drawings must be of professional quality, legibly marked in red ink to record the actual construction configuration, with coversheet labeled "CERTIFIED AS-BUILT", signed and dated by the Contractor, submitted to the Engineer in "Hard Copy", and if so specified in the Bid Proposal "As-Built Drawings" line item, shall also be submitted to the Engineer in AutoCAD format on compact disc. Final payment will be withheld until receipt of record documents.
- D. Specifications and Addenda; legibly mark each Section to record:
 - 1. Manufacturer, trade name, catalog number, and Supplier of each Product and item of equipment actually installed.
 - 2. Changes made by Field Order or by Change Order.
- E. Shop Drawings (after final review and approval):
 - 1. One set of record shop drawings for each process equipment, piping, (including casings) electrical system and instrumentation system.

1.6 SUBMITTAL

- A. At Contract close-out, deliver Record Documents to the Engineer for the Owner.
- B. Accompany submittal with transmittal letter, containing:
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. Title and number of each Record Document.
 - 5. Signature of Contractor or his authorized representative.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01742

WARRANTIES AND BONDS FOR ROADWAY PROJECTS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Compile specified warranties and bonds, as in the General Conditions.
- B. Submit to the Engineer for review and transmittal to Owner.
- C. The contractor shall provide a one (1) year warranty covering workmanship and materials for the following roadway features: expansion joints, pavement, roadway features, grassing items, signal systems, lighting, signage, pavement markings, retaining walls, structure drainage systems, roadway drainage systems, concrete defects, structural steel defects and foundation elements. The contractor shall provide a Maintenance Bond covering the warranty period for all roadway facilities. The contractor assumes sole responsibility for the performance and all associated warranty work for the proposed warranty period.

1.2 RELATED REQUIREMENTS

- A. Instructions to Bidders: Bid or Proposal Bonds.
- B. Conditions of the Contract: Performance Bond and Payment Bond.
- C. Section 00700: General Conditions.
- D. Section 01700: Contract Close-out.
- E. Section 00641: Certifications of Final Completion

1.3 SUBMITTAL REQUIREMENTS

- A. Assemble warranties and maintenance bond, for roadway features.
- C. Number of original signed copies required: Three each.
- D. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.
 - 1. Product or work item.
 - 2. Firm, with name of principal, address and telephone number.
 - 3. Scope.
 - 4. Date of beginning of warranty, bond or service and maintenance contract.
 - 5. Duration of warranty, bond or service maintenance contract.

6. Provide information for Owner's personnel:
 - a. Proper procedure in case of failure.
7. Contractor, name of responsible principal, address and telephone number.

1.4 FORM OF SUBMITTALS

- A. Prepare in triplicate packets.
- B. Format:
 1. Size 8-1/2 inches x 11 inches.
 - a. Fold larger sheets to fit into binders.

1.5 WARRANTY SUBMITTAL REQUIREMENTS

- A. Upon final acceptance of the project, the contractor shall provide a Maintenance Bond for the warranted features to be in effect for the warranty period. The contractor shall provide proof of the Maintenance Bond commitment before execution of the Contract and use a bonding company which, in addition to satisfying the provisions of Section 287.0935, Florida Statutes, has an A.M. Best Rating of "A" or better. If the bonding company drops below the "A" rating during the Maintenance Bond period, the contractor shall provide a new Maintenance Bond for the balance of the warranty period from a bonding company with an "A" rating or better, at no cost to the owner.
- B. At the end of the Warranty Period, the owner will release the contractor from further warranty work and responsibility, provided all previous warranty work and remedial work, if any, has been completed.
- C. The start date for all warranties shall be the date of final acceptance of the project as detailed in section 01700 and 00641 of these specifications.
- D. All warranties to be furnished shall exclude matters resulting from vandalism, traffic accidents, misuse, failure to follow manufacturer's recommendations or acts of God (tornadoes, hurricanes, earthquakes, sink holes, meteorite impacts, etc.). Abnormally high ground water will not be considered an act of God.
- E. The Contractor shall warranty all work as described herein Section 1.1.C and in Table 1.6-1 for one year regardless of the contributing factors involved except as provided in Section 1.5.D above.

1.6 THRESHOLD VALUES AND REMEDIAL ACTIONS

The threshold values and remedial actions for the warranted items for the roadway project are specified in but not limited to Table 1.6-1.

TABLE 1.6-1				
TYPE OF DISTRESS	WARRANTY ITEM (Y/N)	TYPE OF SURVEY	THRESHOLD LEVEL (FOR ASPHALT EACH LOT (0.1 MILE) PER LANE)	REMEDIAL ACTION
Asphalt				
Rutting	Y	Any Survey	Depth > 0.30"	Remove and replace the distressed LOT(s) to the full distressed depth and full lane width.
			Depth ≤ 0.30"	None Required
Ride-ability	Y	Any Survey	RN < 3.69	Remove and replace the distressed LOT(s) to the full distressed area(s) and full lane width
Cracking	Y	Any Survey	Cracking > 1/8" (Class 1B), accumulative cracking length >50'	Remove and replace the distressed LOT(s) to the full distressed depth and full lane width.
Raveling, delamination and other disintegrated areas affecting the friction course	Y	Intermediate Survey	Underlying layer exposed, individual length ≥ 10'	Remove and replace the distressed area(s) to the full distressed depth and full lane width and extend 50' at both ends or temporarily patch the distressed area.
			Underlying layer exposed, individual length < 10'	Patch the distressed area(s) and remove and replace the distressed area(s) to the full distressed depth and full lane width prior to the final survey.
		Final Survey	Observation by Engineer	Replace the distressed area(s) or the patched area(s) and extend 50' at both ends at full lane width.
Pot Holes, slippage area(s), segregated area(s) and other disintegrated areas including separation of roadway widening from original roadway.	Y	Any Survey	Observation by Engineer	Remove and replace the distressed area(s) to the full distressed depth and full lane width and extend 50' at both ends or temporarily patch the distressed area(s) and remove and replace the patched area(s) to the full distressed depth and full lane width and extend 50' at both ends prior to the final survey.

TABLE 1.6-1 CONTINUED

Grassing				
All grassing operations	Y	Any Survey	Observation by Engineer	A healthy stand of grass on all areas of the project will be maintained for the warranty period. Mowing, litter pickup and regular maintenance shall be the responsibility of the Owner. Areas subjected to erosion due to the lack of adequate grass and/or lack of soil compaction on slopes shall require an immediate remedy. Contractor shall install topsoil, regrade and regrass at no cost to the owner. The contractor may elect to regrass in these areas by sodding at no additional cost to the owner. The contractor may be required to water and/or fertilize the grassed areas during the warranty period in order to maintain a healthy stand of grass at no additional cost to the owner. Droughts are NOT an acceptable excuse. Loss of grassing during the warranty period due to erosion around drainage structures and culvert end treatments shall be repaired by the contractor at no additional cost to the owner regardless of the contributing factors involved except as provided in Section 1.5.D.
Signs				
All signs	Y	Any Survey	Observation by Engineer	All signs shall maintain their originally designed intent for the warranty period except as provided in section 1.5 D.
Concrete				
Mitered Ends	Y	Any Survey	Any cracking or breaking during construction and the warranty period.	Contractor shall warranty by removing and replacing any broken concrete mitered ends that were constructed on the project for the warranty period except as provided in section 1.5 D. Breakages due to Normal mowing operations is NOT included in the exceptions and shall be covered as a warranty item.
Headwalls, Drainage Pipe, Drainage structures, concrete turnouts and Other Misc. Concrete Structures	Y	Any Survey	Any cracking, spalding or breaking during construction and the warranty period which reduces its originally designed function.	Contractor shall warranty cracked or broken structures by removing and replacing the structure if deemed non-repairable by the engineer. Contractor shall repair or replace as required any structure that fails due to improper installation (i.e. Drainage pipe that separates and causes undermining of an adjacent drainage structure or other part of the roadway.)

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 02 ARCHITECTURAL SPECIFICATIONS (DAG)

**SECTION 000101
PROJECT TITLE PAGE
WASHINGTON COUNTY LIBRARY EXPANSION
ARCHITECT'S PROJECT 25104:**

**1444 W JACKSON AVE
CHIPLEY, FLORIDA 32428**

ISSUE DATE: 09-04-2025

PREPARED BY: DAG ARCHITECTS

END OF SECTION

SECTION 000102 PROJECT INFORMATION

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

- A. Project Name: WASHINGTON COUNTY PUBLIC LIBRARY.
- B. Architect's Project No. 25014
1444 W Jackson ave, Chipley, FL 32428
Chipley, FloridaProject Location ZIP.
- C. The Owner, hereinafter referred to as Owner: Washington Public Library
- D. Owner's Project Manager: DAG Architects

1.02 PROJECT DESCRIPTION

- A. Summary Project Description: Addition to 3 sides of an existing public library.
- B. Contract Scope: Construction, demolition, renovation, hazardous material removal, and facility operations during occupancy.

1.03 PROJECT CONSULTANTS

- A. The Architect, hereinafter referred to as Architect: DAG Architects.
 - 1. Address: 850 South Gadsden Street.
 - 2. City, State, Zip: Tallahassee, Florida 32301.
 - 3. Phone/Fax: 850-656-7506.
 - 4. E-mail: dpayne@dagarchitects.com.

1.04 PROCUREMENT TIMETABLE

- A. The Owner reserves the right to change the schedule or terminate the entire procurement process at any time.

1.05 PROCUREMENT DOCUMENTS

- A. Availability of Documents: Complete sets of procurement documents may be obtained:
 - 1. From Owner at the Project Manager's address listed above.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 000103 PROJECT DIRECTORY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Identification of project team members and their contact information.

1.02 OWNER:

- A. Name: Washington County Library
1. Address Line 1: 1444 w Jackson Ave.
 2. City: Chipley.
 3. State: Florida.
 4. Zip Code: 32428.
- B. Primary Contact: All correspondence from the Contractor to the Architect will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
1. Title: DAG Architects.
 2. Name: Derrick Payne
 3. Email: dpayne@dagarchitects.

1.03 CONSULTANTS:

- A. Architect: Design Professional of Record. All correspondence from the Contractor regarding construction documents authored by Architect's consultants will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
1. Company Name: DAG Architects.
 - a. 850 South Gadsden Street.
 - b. Suite 140.
 - c. City: Tallahassee.
 - d. State: Florida.
 - e. Zip Code: 32301.
 - f. Telephone: 850-656-7506.
 2. Primary Contact:
 - a. Title: Project Manager.
 - b. Name: Derrick PayneD.
 - c. Email: dpayne@gmail.com.
- B. Civil Engineering Consultant:
1. Company Name: Melvin Engineering.
 - a. Address Line 1: 4426 Layfayette Street.
 - b. City: Marianna.
 - c. State: Florida.
 - d. Zip Code: 32446.
 - e. Telephone: 850-482-3045.
 2. Primary Contact:
 - a. Title: Project Manager.
 - b. Name: Brent E Melvin, P.E.
- C. Structural Engineering Consultant:
1. Company Name: Melvin Engineering.
 - a. Address Line 1: 2541-1 Barrington Circle.
 - b. City: Tallahassee.
 - c. State: Florida.
 - d. Zip Code: 32308.
 - e. Telephone: 850-671-7221.
 2. Primary Contact:
 - a. Title: Senior Structural Engineer.

- b. Name: Jamie Graham P.E.
 - c. Email: <https://slc.bsdspeclink.com/sso/dag>.
- D. Mechanical Engineering Consultant - Plumbing:
 - 1. Company Name: Watford Engineering.
 - a. Address Line 1: 4452 Clinton Street.
 - b. City: Marianna.
 - c. State: Florida
 - d. Zip Code: 850-526-3447.
 - e. Telephone: 850-526-3447.
 - 2. Primary Contact:
 - a. Title: Plumbing Designer.
 - b. Name: Mike Inscho.
 - c. Email: <https://slc.bsdspeclink.com/sso/dag>.
- E. Mechanical Engineering Consultant - HVAC:
 - 1. Company Name: Watford Engineering.
 - a. Address Line 1: 4452 Clinton Street.
 - b. City: Marianna.
 - c. State: Florida.
 - d. Zip Code: 32446.
 - e. Telephone: 850-526-3447.
 - 2. Primary Contact:
 - a. Title: Senior Mechanical Engineer.
 - b. Name: Mike Inscho.
 - c. Email: keith@watford-engineering.com.
- F. Electrical Engineering Consultant:
 - 1. Company Name: Watford Engineering.
 - a. Address Line 1: 4452 Clinton Street.
 - b. City: Marianna.
 - c. State: Florida.
 - d. Zip Code: 32446.
 - e. Telephone: 850-526-3447.
 - 2. Primary Contact:
 - a. Title: Senior Electrical Designer.
 - b. Name: Keith Johnson.
 - c. Email: keith@watford-engineering.com.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 000111
TABLE OF CONTENTS (MASTERFORMAT 1995)

DOCUMENTS 0 -- INTRODUCTORY INFORMATION, BIDDING REQUIREMENTS, AND CONTRACT REQUIREMENTS

1.01 000101 - PROJECT TITLE PAGE

1.02 000102 - PROJECT INFORMATION

1.03 000103 - PROJECT DIRECTORY

1.04 000111 - TABLE OF CONTENTS

DIVISION 1 -- GENERAL REQUIREMENTS

DIVISION 2 -- SITE CONSTRUCTION

3.01 020342 - REMOVAL AND SALVAGE OF PERIOD CONSTRUCTION MATERIALS

3.02 024100 - DEMOLITION

3.03 323313 - SITE BICYCLE RACKS

DIVISION 3 -- CONCRETE

4.01 030516 - UNDERSLAB VAPOR BARRIER - STEGO

4.02 031000 - CONCRETE FORMS AND ACCESSORIES

4.03 031521 - TERMITE BARRIER - POLYGUARD PRODUCTS, INC

4.04 033005 - MOISTURE VAPOR REDUCING ADMIXTURE FOR CAST-IN-PLACE CONCRETE - AVECS

4.05 033511 - CONCRETE FLOOR FINISHES

4.06 033543 - POLISHED CONCRETE FINISHING - CURECRETE

4.07 030100 - MAINTENANCE OF CONCRETE

DIVISION 4 -- MASONRY

5.01 040511 - MORTAR AND MASONRY GROUT

5.02 047100 - SIMULATED BRICK

5.03 042000 - UNIT MASONRY ASSEMBLIES

5.04 042600 - SINGLE-WYTHE UNIT MASONRY

5.05 042300 - GLASS UNIT MASONRY

5.06 042723 - CAVITY WALLS

5.07 040100 - MASONRY RESTORATION AND CLEANING

5.08 040100 - MAINTENANCE OF MASONRY - MTI

DIVISION 5 -- METALS

6.01 050513.11 - SHOP-APPLIED ANODIZED LAYER FOR ALUMINUM - LORIN INDUSTRIES

6.02 055000 - METAL FABRICATIONS

6.03 057000 - ORNAMENTAL METAL

6.04 057300 - ORNAMENTAL HANDRAILS AND RAILINGS

6.05 079513 - EXPANSION JOINT COVER ASSEMBLIES

6.06 050300 - CONSERVATION TREATMENT FOR PERIOD METALS

DIVISION 6 -- WOOD AND PLASTICS

7.01 060573 - WOOD TREATMENT

7.02 061000 - ROUGH CARPENTRY

7.03 061053 - MISCELLANEOUS ROUGH CARPENTRY

7.04 061600 - SHEATHING - USG

7.05 062000 - FINISH CARPENTRY

7.06 064100 - CUSTOM CABINETS

DIVISION 7 -- THERMAL AND MOISTURE PROTECTION

8.01 070543 - CLADDING SUPPORT SYSTEMS

8.02 070553 - FIRE AND SMOKE ASSEMBLY IDENTIFICATION

8.03 072100 - BOARD AND BATT INSULATION

8.04 072119 - FOAMED-IN-PLACE INSULATION

8.05 072500 - WEATHER BARRIERS

8.06 072600 - VAPOR RETARDERS

8.07 072700 - AIR BARRIERS

8.08 074113 - METAL ROOF PANELS

8.09 070150.19 - PREPARATION FOR RE-ROOFING

8.10 076200 - SHEET METAL FLASHING AND TRIM

8.11 077200 - ROOF ACCESSORIES

DIVISION 8 -- DOORS AND WINDOWS

9.01 081113 - STEEL DOORS AND FRAMES

9.02 081416 - FLUSH WOOD DOORS

9.03 087100 - DOOR HARDWARE

9.04 087113 - POWER DOOR OPERATORS

9.05 088000 - GLAZING

9.06 088300 - MIRRORS

DIVISION 9 -- FINISHES

10.01 092236 - LATH

10.02 092400 - PORTLAND CEMENT PLASTER

10.03 092116 - GYPSUM BOARD ASSEMBLIES

10.04 093000 - TILE

10.05 095100 - SUSPENDED ACOUSTICAL CEILINGS - USG

10.06 096500 - RESILIENT FLOORING

10.07 096813 - CARPET TILE

10.08 099113 - EXTERIOR PAINTS

10.09 099123 - INTERIOR PAINTS

DIVISION 10 -- SPECIALTIES

11.01 102113.13 - METAL TOILET COMPARTMENTS

11.02 089100 - WALL LOUVERS

11.03 102600 - WALL AND DOOR PROTECTION

11.04 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

DIVISION 11 -- EQUIPMENT

DIVISION 12 -- FURNISHINGS

13.01 123200 - WOOD CASEWORK

DIVISION 13 -- SPECIAL CONSTRUCTION

DIVISION 14 -- CONVEYING SYSTEMS

DIVISION 15 -- MECHANICAL

DIVISION 16 -- ELECTRICAL

END OF SECTION

SECTION 020342
REMOVAL AND SALVAGE OF PERIOD CONSTRUCTION MATERIALS

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

2.01 PERIOD TREATMENT, GENERAL

- A. See Section 013591 for special procedure requirements related to elements and features of historical significance and value.

2.02 GENERAL PROCEDURES

- A. Drawings indicating existing construction, building services, and site utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction, building services, and site utilities arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing historic elements.
 - 3. Beginning of work constitutes acceptance of existing conditions that are apparent upon examination at that time.
- B. Separate spaces in which removals and salvage operations are conducted from occupied spaces.
 - 1. Provide, erect, and maintain temporary dustproof partitions; see Section 015000.
 - 2. Provide sound retardant temporary partitions in locations indicated on drawings.
 - a. Construct sound retardant temporary partitions with two layers of 5/8-inch (16 mm) gypsum wallboard on each side and cavities fully filled with sound batts.
 - b. Provide partitions with FSTC of 40-43 as determined in the field in accordance with ASTM E336.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; exercise care to prevent water and humidity damage.
- D. See Section 024100 for selective demolition of nonhistoric elements.

2.03 ENVIRONMENTAL CONTROLS

- A. Comply with federal, state, and local regulations pertaining to water, air, solid waste, recycling, chemical waste, sanitary waste, sediment, and noise pollution.

2.04 ITEMS TO BE SALVAGED

- A. General: Salvage elements and components to the maximum extent possible. Maintain a chain of custody of salvaged materials, including the condition of such materials before and after salvage operations.
 - 1. Remove furnishings, equipment, and materials not scheduled for salvage or recycling prior to initiating salvaging procedures.
 - 2. Remove historic items to be salvaged from the structure prior to deconstruction work.
 - 3. Accomplish removal of salvageable items by hand labor to the maximum extent possible.
 - 4. Take care not to damage historic portions of the structure scheduled to remain or items identified for salvage.
 - 5. Obtain hot work permits for removal of elements requiring use of fire- or spark-producing tools or activities that produce sources of ignition.
- B. Site Elements: Remove intact and salvage site elements indicated on drawings.
- C. Concrete Elements: Remove intact and salvage concrete elements indicated on drawings.
- D. Masonry Elements: Remove intact and salvage masonry elements indicated on drawings.
- E. Metal Elements: Remove intact and salvage metal elements indicated on drawings.
- F. Thermal and Moisture Protection Elements: Remove intact and salvage thermal and moisture protection elements indicated on drawings.
- G. Doors and Windows: Remove intact and salvage doors and windows indicated on drawings.

- H. Finishes: Protect special or historic finishes and finish elements indicated on drawings.
- I. Equipment and Specialty Elements: Remove intact and salvage specialty elements indicated on drawings.
- J. Mechanical Equipment: Remove intact and salvage equipment and fixtures indicated on drawings.
- K. Electrical Equipment: Remove intact and salvage equipment and fixtures indicated on drawings.

2.05 MATERIALS TO BE REMOVED

- A. Remove existing nonhistoric elements as indicated and as required to allow direct access to period construction elements indicated to be restored or salvaged for reuse.
 - 1. Remove nonhistoric finishes.
- B. Services: Remove existing systems and equipment to extent indicated, including but not limited to Fire Protection, Plumbing, HVAC, Electrical, and Telecommunications elements:
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and other operational components.
 - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service switchover.
 - 3. See Section 011000 for other limitations on outages and required notifications.
 - 4. Verify that abandoned services serve only abandoned facilities prior to commencing removals.
 - 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stubs and tag with identification.
- C. Protect existing historic elements.
 - 1. Prevent movement of structure; provide temporary, removable shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly, minimizing overcutting.

2.06 MATERIALS TO BE RECYCLED

- A. Recycle removed nonhistoric materials to the maximum extent possible. Remove recyclable materials by hand wherever possible.
- B. Recycle items indicated on drawings.

2.07 CLEANING

- A. Upon completion of work, clean dust, dirt, and debris caused by salvage and demolition operations from portions of existing structure to remain and adjacent areas. Remove and transport debris and rubbish in a manner that prevents spillage on streets or adjacent areas. Obey local regulations regarding hauling and disposal.

END OF SECTION

SECTION 024100 DEMOLITION

PART 3 EXECUTION

1.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 3. Provide, erect, and maintain temporary barriers and security devices.
 - 4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 5. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
 - 6. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
 - 7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Protect existing structures and other elements to remain in place and not removed.
 - 1. Provide bracing and shoring.
 - 2. Prevent movement or settlement of adjacent structures.
 - 3. Stop work immediately if adjacent structures appear to be in danger.

1.02 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

**SECTION 030100
MAINTENANCE OF CONCRETE**

PART 2 PRODUCTS

END OF SECTION

SECTION 030516 UNDERSLAB VAPOR BARRIER - STEGO

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2018a.
- B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

PART 2 PRODUCTS

2.01 MATERIALS

- A. Underslab Vapor Barrier:
 - 1. Water Vapor Permeance: Not more than 0.010 perms (0.6 ng/(s m² Pa)), maximum.
 - 2. Thickness: 15 mils (0.4 mm).
 - 3. Product:
 - a. Stego Industries LLC; Stego Wrap Vapor Barrier (15-mil):
www.stegoindustries.com/#sle.
- B. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams and penetrations in vapor barrier.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E1643.
- B. Install vapor barrier under interior slabs on grade; lap sheet over footings and seal to foundation walls.
- C. Lap joints minimum 6 inches (150 mm).
- D. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.
- E. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.
- F. Repair damaged vapor retarder before covering with other materials.

END OF SECTION

**SECTION 031000
CONCRETE FORMING AND ACCESSORIES**

PART 2 PRODUCTS

1.01 FORMWORK - GENERAL

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
- B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.
- C. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.

END OF SECTION

SECTION 031521
TERMITE BARRIER - POLYGUARD PRODUCTS, INC

PART 2 PRODUCTS

1.01 MANUFACTURERS

- A. Polyguard Products, Inc: www.polyguard.com/#sle.

1.02 TERMITE-RESISTANT SHEET WATERPROOFING

- A. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
- B. Water Absorption: 0.1 percent, maximum, when tested in accordance with ASTM D570.
- C. Tensile Strength, Barrier Composite: 325 psi (2.24 MPa) when tested in accordance with ASTM D412.

END OF SECTION

SECTION 032000 CONCRETE REINFORCING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- B. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2024.
- C. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.

1.02 SUMMARY

- A. Section Includes:
 - 1. Steel reinforcement bars.
 - 2. Welded-wire reinforcement.

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.04 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Each type of steel reinforcement.
 - 2. Bar supports.
 - 3. Mechanical splice couplers.
- B. Shop Drawings: Comply with ACI SP-066:
 - 1. Include placing drawings that detail fabrication, bending, and placement.
 - 2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
 - 1. Location of construction joints is subject to approval of Architect.

1.05 INFORMATIONAL SUBMITTALS

- A. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Steel Reinforcement:
 - a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.
- B. Field quality-control reports.
- C. Minutes of preinstallation conference.

PART 2 PRODUCTS

2.01 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.
- B. Headed-Steel Reinforcing Bars: ASTM A970/A970M.
- C. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.
- D. Galvanized-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from galvanized-steel wire into flat sheets.

2.02 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
 - 1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
- B. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch (1.29 mm) in diameter.
 - 1. Finish: Galvanized.

2.03 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 EXECUTION

3.01 PREPARATION

- A. Protection of In-Place Conditions:
 - 1. Do not cut or puncture vapor retarder.
 - 2. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.02 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
 - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
 - 2. Do not tack weld crossing reinforcing bars.
- C. Preserve clearance between bars of not less than 1 inch (25.4 mm), not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 318.
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.
 - 1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or 24 inches (609.6 mm), whichever is greater.
 - 2. Stagger splices in accordance with ACI 318.
- G. Install welded-wire reinforcement in longest practicable lengths.
 - 1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
 - a. For reinforcement less than W4.0 or D4.0, continuous support spacing to not exceed 12 inches (304.8 mm).
 - 2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches (50.8 mm) for plain wire and 8 inches (203.2 mm) for deformed wire.
 - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
 - 4. Lace overlaps with wire.

3.03 JOINTS

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement.
 - 2. Continue reinforcement across construction joints unless otherwise indicated.

3. Do not continue reinforcement through sides of strip placements of floors and slabs.

3.04 INSTALLATION TOLERANCES

- A. Comply with ACI 117.

END OF SECTION

SECTION 033000 CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2025b.
- B. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2023.
- C. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.
- D. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2024.
- E. ASTM C138/C138M - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete; 2024a.
- F. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- G. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- H. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.
- I. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete; 2017.
- J. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2024.
- K. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).
- L. ASTM C595/C595M - Standard Specification for Blended Hydraulic Cements; 2021.
- M. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2025a.
- N. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- O. ASTM C989/C989M - Standard Specification for Slag Cement for Use in Concrete and Mortars; 2025.
- P. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2024.
- Q. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2025a.
- R. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.
- S. ASTM C1260 - Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method); 2021.
- T. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.
- U. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types); 2023.
- V. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).
- W. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025a.
- X. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers; 2020.
- Y. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2018a.

- Z. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

1.02 SUMMARY

- A. Section Includes:
1. Concrete standards.
 2. Concrete materials.
 3. Admixtures.
 4. Vapor retarders.
 5. Floor and slab treatments.
 6. Liquid floor treatments.
 7. Curing materials.
 8. Accessories.
 9. Repair materials.
 10. Concrete mixture materials.
 11. Concrete mixture class types.
 12. Concrete mixing.
- B. Related Requirements:
1. Section 03 20 00 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.04 ACTION SUBMITTALS

- A. Product data.
- B. Design Mixtures: For each concrete mixture, include the following:
1. Mixture identification.
 2. Compressive strength at 28 days or other age as specified.
 3. Compressive strength required at stages of construction.
 4. Durability exposure classes for Exposure Categories F, S, W, and C.
 5. Maximum w/cm ratio.
 6. Calculated equilibrium and fresh density for lightweight concrete.
 7. Slump or slump flow limit.
 8. Air content.
 9. Nominal maximum aggregate size.
 10. Intended placement method.
 11. Submit adjustments to design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant changes.
- C. Shop Drawings:
1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
- D. Samples: For vapor retarder.

1.05 INFORMATIONAL SUBMITTALS

- A. Testing Agency: Include documentation indicating compliance with ASTM E329 or ASTM C1077 and copies of applicable ACI certificates for testing technicians or ACI Concrete Construction Special Inspector - MH, ASCC.
- B. Material certificates.
- C. Material test reports.
- D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances in accordance with ACI 117 and in compliance with ASTM E1155.

- E. Research reports.
- F. Preconstruction test reports.
- G. Field quality-control reports.
- H. Minutes of preinstallation conference.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified Installer who employs Project personnel qualified as an ACI-certified Concrete Flatwork Associate and Concrete Flatwork Finisher and a supervisor who is a certified ACI Advanced Concrete Flatwork Finisher/Technician or an ACI Concrete Flatwork Finisher with experience installing and finishing concrete.
 - 1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.
- B. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing that performs duties on behalf of the Architect/Engineer.
- C. Field Quality-Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1.07 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 CONCRETE STANDARDS

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.02 CONCRETE MATERIALS

- A. Cementitious Materials:
 - 1. Portland Cement: ASTM C150/C150M, Type II, gray.
 - 2. Blended Hydraulic Cement: ASTM C595/C595M, Type IS, portland blast-furnace slag cement.
 - 3. Performance-Based Hydraulic Cement: ASTM C1157/C1157M: Type MS, moderate sulfate resistance.
 - 4. Pozzolans: ASTM C618, Class C, F, or N.
 - 5. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
 - 6. Ground Glass Pozzolan: ASTM C1866/C1866M, Type GS or GE.
 - 7. Silica Fume: ASTM C1240.
- B. Normal-Weight Aggregates:
 - 1. Coarse Aggregate: ASTM C33/C33M, Class 3M
 - 2. Maximum Coarse-Aggregate Size: 1 inch (25.4 mm) nominal.
 - 3. Fine Aggregate: ASTM C33/C33M.
 - 4. Alkali-Silica Reaction: Comply with one of the following for each aggregate used:
 - a. Expansion Result of Aggregate: Not more than 0.04 percent at one year when tested in accordance with ASTM C1293.
 - b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567. Do not use this option with fly ash with an alkali content greater than 4.0 percent. Submit supporting data for each aggregate showing expansion in excess of 0.10 percent when tested in accordance with ASTM C1260.

- c. Alkali Content in Concrete: Not to exceed 4 lb./cu. yd. for aggregate with expansion greater than or equal to 0.04 percent and less than 0.12 percent or 3 lb./cu. yd. for aggregate with expansion greater than or equal to 0.12 percent and less than 0.24 percent. Test aggregate reactivity in accordance with ASTM C1293. Calculate alkali content of concrete in accordance with ACI 301. Do not use this option with natural pozzolan or fly ash that has a calcium oxide content greater than 18 percent or an alkali content greater than 4.0 percent; or for an aggregate with expansion at one year greater than or equal to 0.24 percent when tested in accordance with ASTM C1293.
- C. Ground Calcium Carbonate or Aggregate Mineral Filler: ASTM C1797. Unless otherwise permitted, do not use mineral filler derived from carbonate sources in concrete for members assigned to Exposure Class S1, S2, or S3.

2.03 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C260/C260M.
- B. Chemical Admixtures: Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 - 2. Retarding Admixture: ASTM C494/C494M, Type B.
 - 3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
 - 5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
 - 6. Admixtures with special properties, with documentation of claimed performance enhancement, ASTM C494/C494M, Type S.
 - 7. Moisture-Vapor-Reducing Admixture: ASTM C494/C494M, Type S, hydrophilic, moisture-vapor-reducing, capable of reducing water absorption in and moisture-vapor emission from concrete (MVRA).
 - 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) AQUAFIN, Inc.
 - 2) Barrier One, Inc.
 - 3) Xypex Chemical Corporation.
- C. Mixing Water for Concrete Mixtures and Water Used to Make Ice: ASTM C1602/C1602M. Include documentation of compliance with limits for alkalis, sulfates, chlorides, or solids content of mixing water from Table 2 inch (50.8 mm) ASTM C1602/C1602M.

2.04 VAPOR RETARDERS

- A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A. Include manufacturer's recommended thickness and adhesive or pressure-sensitive tape.
 - 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. Barrier-Bac; Inteplast Group.
 - b. Poly-America, L.P.
 - c. Stego Industries, LLC.

2.05 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - 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. ChemMasters, Inc.
 - b. Dayton Superior Corporation.

- c. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
 - 1. Color:
 - a. Ambient Temperature Below 50 deg F (10 deg C): Black.
 - b. Ambient Temperature between 50 and 85 deg F (10 and 29 deg C): Any color.
 - c. Ambient Temperature Above 85 deg F (29 deg C): White.
- D. Water: Potable water that does not cause staining of the surface.

2.06 ACCESSORIES

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 inch (2032 mm) accordance with ASTM D2240.
- C. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C881/C881M, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade and class to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.07 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.18 mm) and that can be feathered at edges to match adjacent floor elevations.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.35 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.

2.08 CONCRETE MIXTURE MATERIALS

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.
 - 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland or hydraulic cement in concrete assigned to Exposure Class F3 as follows:
 - 1. Fly Ash or Other Pozzolans: 25 percent by mass.
 - 2. Slag Cement: 50 percent by mass.
 - 3. Silica Fume: 10 percent by mass.
 - 4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
 - 5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
 - 1. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
 - 2. Use permeability-reducing admixture in concrete mixtures where indicated.

2.09 CONCRETE MIXTURE CLASS TYPES

- A. Class A: Normal-weight concrete used for footings, grade beams, and tie beams.
 - 1. Exposure Class: ACI 318 Class C1.

2. Minimum Compressive Strength: 3000 psi (20684.28 kPa) at 28 days.
 3. Maximum w/cm Ratio: 0.50.
 4. Slump Limit: 4 inches, plus or minus 1 inch (25.4 mm) for concrete.
 5. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cementitious materials.
- B. Class B: Normal-weight concrete used for foundation walls.
1. Exposure Class: ACI 318 Class C1.
 2. Minimum Compressive Strength: 3000 psi (20684.28 kPa) at 28 days.
 3. Maximum w/cm Ratio: 0.50.
 4. Slump Limit: 4 inches, plus or minus 1 inch (25.4 mm) for concrete.
 5. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- C. Class C: Normal-weight concrete used for interior slabs-on-ground.
1. Exposure Class: ACI 318 Class C0.
 2. Minimum Compressive Strength: 3000 psi (20684.28 kPa) at 28 days.
 3. Maximum w/cm Ratio : 0.50.
 4. Slump Limit: 4 inches, plus or minus 1 inch (25.4 mm) for concrete.
 5. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.

2.10 CONCRETE MIXING

- A. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.
1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Before placing concrete, verify that installation of concrete forms, accessories, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not proceed until unsatisfactory conditions have been corrected.

3.02 TOLERANCES

- A. Comply with ACI 117.

3.03 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

3.04 INSTALLATION OF VAPOR RETARDERS

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.
- B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder in accordance with manufacturer's written instructions.

3.05 INSTALLATION OF CAST-IN-PLACE CONCRETE

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Water addition in transit or at the Project site must be in accordance with ASTM C94/C94M and must not exceed the permitted amount indicated on the concrete delivery ticket.
- D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

3.06 INSTALLATION OF JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
 - 1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
 - 2. Place joints perpendicular to main reinforcement.
 - a. Continue reinforcement across construction joints unless otherwise indicated.
 - 3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.18 mm). Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
 - 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints:
 - 1. Install dowel bars and support assemblies at joints where indicated on Drawings.
 - 2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

3.07 APPLICATION OF FINISHING FLOORS AND SLABS

- A. Float Finish:
 - 1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
 - 2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
 - 3. Apply float finish to surfaces to receive trowel finish.
- B. Trowel Finish:
 - 1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
 - 2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
 - 3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

4. Do not add water to concrete surface. Use of an approved finishing aid is acceptable.
 5. Do not apply troweled finish to concrete, which has a total air content greater than 3 percent.
 6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:
 - a. Slabs on Ground:
 - 1) Specified overall values of flatness, FF 35; and of levelness, FL 25; with minimum local values of flatness, FF 24; and of levelness, FL 17.
- C. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with a fiber-bristle broom perpendicular to main traffic route.
 2. Coordinate required final finish with Architect before application.

3.08 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

- A. Filling in:
1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
 2. Mix, place, and cure concrete, as specified, to match color and texture with in-place construction exposed to view.
 3. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations:
1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 2. Construct concrete bases 8 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
 3. Minimum Compressive Strength: 3000 psi (20684.28 kPa) at 28 days.
 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 substrate.
 6. Prior to pouring concrete, place and secure anchorage devices.
 - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - b. Cast anchor-bolt insert into bases.
 - c. Install anchor bolts to elevations required for proper attachment to supported equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items.
1. Cast-in inserts and accessories, as shown on Drawings.
 2. Screed, tamp, and trowel finish concrete surfaces.

3.09 APPLICATION OF CONCRETE CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
1. Comply with ACI 301 for cold weather protection during curing.
 2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.

3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305R, before and during finishing operations.
- B. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:
 1. Begin curing after finishing concrete.
 2. Interior Concrete Floors:
 - a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - (a) Lap edges and ends of absorptive cover not less than 12 inches.
 - (b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
 - (a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - (b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following not in cold weather:
 - (a) Water.
 - (b) Continuous water-fog spray.
 - b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - (a) Lap edges and ends of absorptive cover not less than 12 inches.
 - (b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
 - (a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - (b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - (a) Water.
 - (b) Continuous water-fog spray.
 - c. Floors to Receive Polished Finish: Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - (a) Lap edges and ends of absorptive cover not less than 12 inches.
 - (b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - (a) Water.

- (b) Continuous water-fog spray.
- d. Floors To Receive Chemical Stain:
 - 1) As soon as concrete has sufficient set to permit application without marring concrete surface, install curing paper over entire area of floor.
 - 2) Install curing paper square to building lines, without wrinkles, and in a single length without end joints.
 - 3) Butt sides of curing paper tight; do not overlap sides of curing paper.
 - 4) Leave curing paper in place for duration of curing period, but not less than 28 days.
- e. Floors To Receive Curing Compound:
 - 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
 - 3) Maintain continuity of coating, and repair damage during curing period.
 - 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

3.10 INSTALLATION OF JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

3.11 INSTALLATION OF CONCRETE SURFACE REPAIRS

- A. Defective Concrete:
 - 1. Repair and patch defective areas when approved by Architect.
 - 2. Remove and replace concrete that cannot be repaired and patched to meet specification requirements.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks in excess of 0.01 inch (0.25 mm) spalls, air bubbles exceeding surface finish limits, honeycombs, rock pockets, fins and other projections on the surface exceeding surface finish limits, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (12.7 mm) in any dimension to solid concrete.
 - a. Limit cut depth to 3/4 inch (19.05 mm).
 - b. Make edges of cuts perpendicular to concrete surface.
 - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
 - d. Fill and compact with patching mortar before bonding agent has dried.
 - e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
 - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
 - b. Compact mortar in place and match surrounding surface.
 - 3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance, as determined by Architect.
- D. Repairing Unformed Surfaces:
 - 1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
 - a. Correct low and high areas.

- b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width.
 3. After concrete has cured at least 14 days, correct high areas by grinding.
 4. Correct localized low areas during, or immediately after, completing surface-finishing operations by adding patching mortar.
 - a. Finish repaired areas to blend into adjacent concrete.
 5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
 - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - b. Feather edges to match adjacent floor elevations.
 6. Correct other low areas scheduled to remain exposed with repair topping.
 - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6.35 mm) to match adjacent floor elevations.
 - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 7. Repair defective areas, except random cracks and single holes 1 inch (25.4 mm) or less in diameter, by cutting out and replacing with fresh concrete.
 - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
 - b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
 - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
 - d. Place, compact, and finish to blend with adjacent finished concrete.
 - e. Cure in same manner as adjacent concrete.
 8. Repair random cracks and single holes 1 inch (25.4 mm) or less in diameter with patching mortar.
 - a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
 - b. Dampen cleaned concrete surfaces and apply bonding agent.
 - c. Place patching mortar before bonding agent has dried.
 - d. Compact patching mortar and finish to match adjacent concrete.
 - e. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.12 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
 1. Testing agency to be responsible for providing curing facility for initial curing of strength test specimens on-site and verifying that test specimens are cured in accordance with standard curing requirements in ASTM C31/C31M.
 2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.

3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
- C. Delivery Tickets: Comply with ASTM C94/C94M.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C172/C172M to be performed in accordance with the following requirements:
 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 150 cu. yd. or fraction thereof.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing is to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C143/C143M:
 - a. One test at point of delivery for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests as needed.
 3. Concrete Temperature: ASTM C1064/C1064M:
 - a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample when strength test specimens are cast.
 4. Concrete Density: ASTM C138/C138M:
 - a. One test for each composite sample when strength test specimens are cast.
 5. Unit Weight: ASTM C138/C138M density of fresh structural lightweight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture. The fresh density should be consistent with that associated with the equilibrium density within a tolerance of plus or minus 4 lb/ft.³.
 6. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast and standard cure two sets of four 6 inches (152.4 mm) by 12-inches or 4-inch by 8-inch cylindrical specimens for each composite sample.
 - b. Cast, and field cure two sets of four standard cylindrical specimens for each composite sample.
 7. Compressive-Strength Tests: ASTM C39/C39M.
 - a. Test one set of two standard cured specimens at seven days and one set of two specimens at 28 days.
 8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests of standard cured cylinders equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3447.38 kPa) if specified compressive strength is 5000 psi (34473.80 kPa), or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
 10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 11. Additional Tests:
 - a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
 - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
 - 1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.7.6.3.

12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 48 hours of completion of floor finishing and promptly report test results to Architect.

3.13 PROTECTION

- A. Protect concrete surfaces.
- B. Protect from petroleum stains.
- C. Prohibit vehicles from interior concrete slabs.
- D. Prohibit placement of steel items on concrete surfaces.

END OF SECTION

SECTION 033005

MOISTURE VAPOR REDUCING ADMIXTURE FOR CAST-IN-PLACE CONCRETE - AVECS

PART 2 PRODUCTS

1.01 MOISTURE VAPOR REDUCING ADMIXTURE

- A. Moisture Vapor Reducing Admixture (MVRA): ASTM C494/C494M, Type S; liquid, inorganic admixture free of volatile organic compounds (VOCs); formulated to react with cementitious material to integrally and permanently restricting capillary systems formed during curing.
1. Hydraulic Conductivity: 19.7×10^{-8} fps (6×10^{-8} cm/s), minimum, when tested according to ASTM D5084.
 2. Concrete Shrinkage Reduction at 28 Days: 50 percent, minimum, when compared to mix design without MVRA and both tested according to ASTM C157/C157M.
 3. Toxicity: None.
 4. Odor: None.
 5. Flammability: None.
 6. VOC: Zero.
 7. Solvent: Water.
 8. Freezing Temperature: 32 degrees F (0 degrees C).
 9. Hazardous Vapors: None.
 10. Capillary Break: Calcium silicate hydrate.
 11. pH: 11.3.
 12. Weight: 8.83 lbs per gal (1.06 kg/L).
 13. Specific Gravity: 1.044.
 14. Products:

END OF SECTION

**SECTION 033511
CONCRETE FLOOR FINISHES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface treatments.
- B. High-gloss sealer.
- C. Low-gloss sealer.
- D. Clear coatings.
- E. Polished concrete.

PART 2 PRODUCTS

END OF SECTION

SECTION 033543
POLISHED CONCRETE FINISHING - CURECRETE

PART 2 PRODUCTS

1.01 MANUFACTURERS

- A. Curecrete Distribution, Inc; RetroPlate System: www.curecrete.com/#sle.

1.02 POLISHED CONCRETE SYSTEM

- A. Components:
1. Hardener, Sealer, and Densifier: Penetrating, water-based, odorless liquid complying with industry-standard VOC requirements; does not leave film on surface.
 - a. Product: Curecrete Distribution, Inc; RetroPlate 99.
 2. Concrete Clarity Enhancer and Grinding Accelerant:
 - a. Product: Curecrete Distribution, Inc; KickStart.
 3. Joint Filler: Semi-rigid, moisture-insensitive, two-component, self-leveling, 100-percent solids, rapid-curing polyurea joint and crack filler.
 - a. Hardness: 65, Shore A.
 - b. Product: Curecrete Distribution, Inc; CreteFill Pro 85.
 4. Oil-Repelling Sealer: Prevents oil and water from penetrating floor and causing whitening.
 - a. Product: Curecrete Distribution, Inc; RetroPel.
 5. Stain Protection: Topical coating, protecting against staining by preventing immediate damage to floor surface and increasing window of opportunity for cleanup.
 - a. Product: Curecrete Distribution, Inc; RetroGuard.
 6. Transparent Concrete Dye: Topically applied.
 - a. Product: Curecrete Distribution, Inc; RetroPlate Concrete Dye Concentrate.
 7. Cleaning Solution: Designed to clean densified and densified-polished concrete floors.
 - a. Product: Curecrete Distribution, Inc; CreteClean Plus.
- B. ASCC Concrete Polishing Council Aggregate Appearance Classification:

END OF SECTION

SECTION 040100 MAINTENANCE OF MASONRY - MTI

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Replacement of _____ units.
- B. Retrofitting masonry veneer accessories.

1.02 RELATED REQUIREMENTS

- A. Section 024100 - Demolition.
- B. Section 040511 - Masonry Mortaring and Grouting.
- C. Section 042000 - Unit Masonry.
- D. Section 072100 - Thermal Insulation.
- E. Section 072119 - Foamed-In-Place Insulation.

1.03 REFERENCE STANDARDS

- A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing work of this section.
 - 1. Review installation conditions and procedures, and coordinate with related work.

1.05 QUALITY ASSURANCE - MASONRY WORK

- A. Restorer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 MOCK-UPS

- A. See drawings for additional requirements.
- B. Restore and repoint existing masonry wall area sized 8 feet (2.40 m) long by 6 feet (2 m) high; include in mock-up area instances of mortar, accessories, wall openings, and flashings.
- C. Locate where directed.
- D. Acceptable panel and procedures employed will become standard for work of this section.
- E. Mock-up may remain as part of work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.
- B. Store materials in accordance with manufacturer's requirements and in covered, well-ventilated area protected from exposure to detrimental conditions including airborne contaminants, dirt, dust, sunlight, temperatures lower than 40 degrees F (4 degrees C) or greater than 100 degrees F (38 degrees C), rainfall, sparks, or flame.

1.08 FIELD CONDITIONS - MASONRY WORK

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.
- B. Maintain materials and surrounding air temperature above 40 degrees F (4 degrees C) prior to, during, and 48 hours after completion of masonry work.
- C. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.
- D. Do not use process that creates dust when wind is over 10 mph (16 kph).

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Masonry Technology, Inc: www.mtidry.com/#sle.
- B. Substitutions: See Section 016000 - Product Requirements.

2.02 MASONRY ACCESSORIES

- A. Retrofit Weeps:
 - 1. Cylindrical polypropylene, 3/8 inch (9.5 mm) diameter by depth of brick, anchored in drilled hole in mortar joint with manufacturer's recommended two-part epoxy bonding agent.
 - 2. Installation tool and temporary weep rods.
 - 3. Product: MTI Retrofit Weep.
- B. Retrofit Wall Ties:
 - 1. Type 304 stainless steel, 3/8 inch (9.5 mm) high by 7 inches (178 mm) long, designed for retrofit installation in rainscreen veneer applications, anchored to stud framing with fasteners and in mortar joint with anchoring epoxy from interior side of veneer.
 - 2. Anchoring epoxy as recommended by tie manufacturer.
 - 3. Product: MTI Retrofit Brick Tie.
- C. Veneer Cavity Drainage Plane:
 - 1. High-impact, perforated, corrugated, polyester sheet, thickness 3/16 inch (5 mm) nominal, with spun-bonded polypropylene fabric facer.
 - a. Product: MTI Fire-Rated Sure Cavity.
- D. Floor Slab Edge Treatment:
 - 1. Preformed, folded "L" shaped, high-impact corrugated polystyrene sheet, thickness 3/8 inch (10 mm) nominal.
 - 2. Product: MTI Floor Edging.

2.03 MASONRY MATERIALS

- A. Mortar and Grout: Section 040511.
- B. Brick: Section 042000.
- C. CMU: Section 042000.
- D. Foamed-in-Place Insulation: Section 072119.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Ensure that existing construction and new work are ready to receive work of this section.

3.02 PREPARATION

- A. Protect elements from damage due to restoration procedures.
- B. Separate existing areas from restoration areas to prevent damage.
- C. Close off adjacent occupied areas with dustproof and weatherproof partitions.
- D. Protect roof membrane and flashings from damage with 1/2-inch (13 mm) plywood laid on roof surfaces over full extent of work area and traffic route.
- E. Demolition and Removal:
 - 1. Demolish deteriorated material from area indicated for retrofit.
 - 2. See Section 017419 - Construction Waste Management and Disposal for additional requirements.
 - 3. See Section 024100 - Demolition for additional requirements.
- F. Replacement:
 - 1. Replace structural components where indicated in contract documents.

2. Do not install new exterior sheathing to replace removed sheathing unless otherwise indicated.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's written instructions.
- B. Retrofit Wall Ties:
 1. Remove interior finish materials such as plaster and drywall. Remove insulation in stud cavity. Remove wall sheathing to expose masonry veneer to interior of building.
 2. After removal of wall sheathing, examine newly-created rainscreen cavity. Ensure it is clear of debris. Vacuum debris from cavity.
 3. Install retrofit brick ties at not more than 16 inches (400 mm) on center.
 4. Drill hole in mortar joint in alignment with face of stud, clean debris from hole, inject epoxy adhesive using manufacturer's recommended tool, insert retrofit brick tie, and fasten tie to stud.
- C. Retrofit Weeps:
 1. Ensure masonry cavity is clean of dust and debris.
 2. Drill 3/8 inch (9.5 mm) diameter holes in mortar joints at not more than 16 inches (400 mm) on center at weep elevation.
 3. Remove dust and debris.
 4. Apply bonding agent to exterior of weep and insert weep into prepared hole using weep installation tool. Position exterior of weep slightly inset from exterior surface of veneer.
 5. Ensure weep device extends into masonry cavity.
 6. Insert retrofit weep rods into weep devices 2 inches (50 mm) nominal.
 7. Remove retrofit weep rods after materials have set up.
- D. Veneer Cavity Drainage Plane:
 1. Install veneer cavity drainage on interior-facing masonry surface and bottom of masonry cavity. Install corrugations toward masonry, facer toward interior of building.
 2. Field fabricate sheets as necessary.
- E. Install sprayed-in-place foam plastic insulation to fully fill stud-masonry cavity. See Section 072119.
- F. Floor Slab Edge Treatment: Install edging along perimeter wall. Lap edging over veneer cavity drainage plane. Lap ends of adjacent edging.

3.04 REBUILDING

- A. Cut out damaged and deteriorated masonry. Do not damage adjacent remaining materials.
- B. Support structure as necessary in advance of cutting out units.
- C. Where loose or unsound adjoining masonry is encountered, notify Architect, obtain Architect's approval, and remove or remediate as directed by Architect.
- D. Build in new masonry units as specified in other sections.
- E. Ensure that anchors are located and installed as indicated in contract documents and manufacturer's instructions.
- F. Install tuckpoint retrofit weeps in mortar bed joints in accordance with manufacturer's instructions.
- G. Install built-in masonry to match and align with existing work, with joints and coursing true and level and faces plumb and true to line. Build in openings, accessories, and fittings.

3.05 CLEANING

- A. Immediately remove stains, efflorescence, or other excess resulting from work of this section.
- B. Remove excess mortar, smears, and droppings as work proceeds and upon completion.
- C. Clean surrounding surfaces.

END OF SECTION

SECTION 040100 MAINTENANCE OF MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Replacement of _____ units.
- B. Repointing mortar joints.
- C. Repair of damaged masonry.
- D. Surface reinforcing of bowed, cracked, and weakened masonry with CFRP.
- E. Retrofitting masonry veneer construction with brick ties and weeps.

1.02 RELATED REQUIREMENTS

- A. Section 040511 - Masonry Mortaring and Grouting.
- B. Section 042000 - Unit Masonry: Brick masonry units.
- C. Section 042000 - Unit Masonry: Mortar and grout.
- D. Section 042600 - Single-Wythe Unit Masonry.
- E. Section 044200 - Exterior Stone Cladding.

1.03 ABBREVIATIONS AND ACRONYMS

- A. CFRP: Carbon Fiber Reinforced Polymer.

1.04 DEFINITIONS

- A. Carbon Fiber Reinforced Polymer: Composite material comprising a polymer matrix reinforced with carbon fiber cloth, mat, or strands.

1.05 REFERENCE STANDARDS

- A. ACI PRC-440.7 - Externally Bonded Fiber-Reinforced Polymer Systems Design and Construction for Strengthening Masonry Structures - Guide; 2022.
- B. ACI SPEC-440.8 - Specification for Carbon and Glass Fiber-Reinforced Polymer (FRP) Materials Made by Wet Layup for External Strengthening of Concrete and Masonry Structures; 2013 (Reapproved 2023).
- C. ACI SPEC-548.14 - Specification for Repairing Concrete with Epoxy Mortar; 2014.
- D. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- E. ASTM D3039/D3039M - Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials; 2017.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- G. ICC-ES AC125 - Acceptance Criteria for Concrete and Reinforced and Unreinforced Masonry Strengthening Using Externally Bonded Fiber-Reinforced Polymer (FRP) Composite Systems; 2021, with Editorial Revision (2022).
- H. ICC-ES AC178 - Acceptance Criteria for Inspection and Verification of Concrete and Reinforced and Unreinforced Masonry Strengthening Using Fiber-Reinforced Polymer (FRP) or Steel-Reinforced Polymer (SRP) Composite Systems; 2017, with Editorial Revision (2020).
- I. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.06 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing work of this section.
 - 1. Require attendance of parties directly affecting work of this section.

2. Review conditions of installation, installation procedures, and coordination with related work.
- B. Scheduling:
 1. Perform cleaning and washing of masonry between the hours of 7 am to 11 pm only.
 2. Perform blast cleaning of masonry between the hours of 7 am to 11 pm only.

1.07 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on cleaning compounds.
- C. Product Data: Provide manufacturer's product data and MSDS sheets on CFRP systems, including physical and chemical characteristics, material specifications for each component, limitations on use of system, construction or application instructions, maintenance instructions, and general manufacturer's recommendations regarding each system.
- D. Shop Drawings: Indicate setting details of stone. Detail shoring.
- E. Samples: Two CFRP plates, 12 by 12 inches (300 by 300 mm) in size.
- F. Test Reports: Provide testing information on combination of carbon fiber reinforcement and epoxy when used together as a system.
- G. Manufacturer's Instructions: For cleaning materials, indicate special procedures, conditions requiring special attention.

1.08 QUALITY ASSURANCE - MASONRY WORK

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
 1. Maintain one copy of each document on project site.
- B. Restorer: Company specializing in masonry restoration with minimum three years of documented experience.

1.09 MOCK-UPS

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Mock-up may remain as part of the Work.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.
- B. Deliver polymer resin materials in original factory-sealed containers with manufacturer's labels intact and legible with verification of product nomenclature, manufacturer's name, product identification and batch number, date of manufacture, and shelf life or expiration date. Do not use polymer resin materials that have exceeded shelf life.
- C. Store materials in covered, well-ventilated area protected from exposure to detrimental conditions, including airborne contaminants, dirt, dust, sunlight, temperatures lower than 40 degrees F (4 degrees C) or greater than 100 degrees F (38 degrees C), rainfall, sparks, or flame, and in accordance with the manufacturer's requirements. Store polymer resins and hardeners in separate area from construction materials that can absorb odors.

1.11 FIELD CONDITIONS - MASONRY WORK

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.
- B. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.
- C. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

1.12 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Warranty: Provide 5-year warranty for CFRP system design, installation, bond to the substrate, and interlaminar bond, as well as mechanical property retention and fabric-resin compatibility, commencing on Date of Substantial Completion. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Restoration and Cleaning Chemicals:
 - 1. Diedrich Technologies, Inc; ____: www.diedrichtechnologies.com/#sle.
 - 2. Substitutions: See Section 016000 - Product Requirements.

2.02 CLEANING MATERIALS

- A. Cleaning Agent: Detergent type.
- B. Cleaning Agent: 0.5 lb (227 g) of sodium hydrosulfite mixture to one gallon (3.8 L) of water.
- C. Acid Solution: Clean, stain free, commercial hydrochloric (muriatic) acid, mixed one part to 10 parts of potable water.

2.03 RETROFIT ACCESSORIES

- A. Manufacturers:
 - 1. Masonry Technology, Inc; Retrofit Weep: www.mtidry.com/#sle.
 - 2. Substitutions: See Section 016000 - Product Requirements.
- B. Description:
 - 1. Retrofit Wall Ties: Type 304 stainless steel, 3/8 inch (9.5 mm) high by 7 inches (178 mm) long, designed for retrofit installation in rainscreen applications, anchored to stud framing with fasteners and in mortar joint with anchoring epoxy from interior.
 - 2. Retrofit Weeps: Polyethylene, 3/8 inch (9.5 mm) diameter by depth of brick, anchored in drilled hole in mortar joint with two-part epoxy bonding agent.

2.04 MORTAR MATERIALS

- A. Comply with requirements of Section 040511.

2.05 MASONRY MATERIALS

- A. Brick: Section 042000.
- B. Stone Veneer: Section 044200.
- C. Clay Tile: Section 042000.
- D. Block: Section 042000.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces to be cleaned are ready for work of this section.
- B. Verify that masonry surfaces to receive CFRP are as dry as recommended by CFRP system manufacturer. Evaluate moisture content in accordance with ACI SPEC-548.14.

3.02 PREPARATION

- A. Protect surrounding elements from damage due to restoration procedures.
- B. Carefully remove and store removable items located in areas to be restored, including fixtures, fittings, finish hardware, and accessories; reinstall upon completion.
- C. Separate areas to be protected from restoration areas using means adequate to prevent damage.
- D. Cover existing landscaping with tarpaulins or similar covers.

- E. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.
- F. Close off adjacent occupied areas with dust proof and weatherproof partitions.
- G. Protect roof membrane and flashings from damage with 1/2 inch (13 mm) plywood laid on roof surfaces over full extent of work area and traffic route.
- H. When using cleaning methods that involve water or other liquids, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.
- I. Do not allow cleaning runoff to drain into sanitary or storm sewers.

3.03 PREPARATION - CFRP

- A. Surface Preparation:
 - 1. Repair all cracks by using hydraulic cement or epoxy paste before installing carbon fiber.
 - 2. Cleaning: Remove loose and unsound materials and other conditions that would inhibit bond, such as laitance, dust, dirt, oil, curing compound, existing paint or coatings, efflorescence, and other matter that could interfere with bond of CFRP system to masonry or repaired surfaces to which CFRP system is to be applied.
 - 3. Apply CFRP composite system to prepared wall within 72 hours of performing surface preparation.
- B. Mortar Joint Preparation:
 - 1. Tooled Mortar Joints: Fill with putty or epoxy paste to make mortar joints flush with masonry units. Ensure that localized, out-of-plane variations between masonry units do not exceed 1/16 inch (1.6 mm) or tolerances recommended by the CFRP system manufacturer, whichever is smaller. Smooth localized, out-of-plane variations in the masonry units using putty or epoxy paste as needed. Fill holes greater than 1/4 inch (6 mm) in diameter and other voids with putty or epoxy paste.
 - 2. Untooled Mortar Joints: Grind or chisel flush with surface protuberances, irregularities, or untooled mortar joints that protrude beyond masonry surface.

3.04 PREPARATION - RETROFIT ACCESSORIES

- A. Demolition:
 - 1. See Section 024100 - Demolition for additional requirements.
 - 2. Demolish all deteriorated material from area to be retrofitted.
- B. Removal:
 - 1. See Section 024100 - Demolition for additional requirements.
- C. Replacement:
 - 1. Replace structural components as needed.

3.05 INSTALLATION - RETROFIT ACCESSORIES

- A. Install in accordance with manufacturer's written instructions.

3.06 REBUILDING

- A. Cut out damaged and deteriorated masonry with care in a manner to prevent damage to any adjacent remaining materials.
- B. Support structure as necessary in advance of cutting out units.
- C. Cut away loose or unsound adjoining masonry as directed.
- D. Build in new units following procedures for new work specified in other section(s).
- E. Mortar Mix: Colored and proportioned to match existing work.
- F. Ensure that anchors are correctly located and built in.
- G. Install built in masonry work to match and align with existing, with joints and coursing true and level, faces plumb and in line. Build in all openings, accessories and fittings.

3.07 REPOINTING

- A. Perform repointing prior to cleaning masonry surfaces.
- B. Cut out loose or disintegrated mortar in joints to minimum 1/2 inch (6 mm) depth or until sound mortar is reached.
- C. Use power tools only after test cuts determine no damage to masonry units will result.
- D. Do not damage masonry units.
- E. When cutting is complete, remove dust and loose material by brushing.
- F. Premoisten joint and apply mortar. Pack tightly in maximum 1/4 inch (6 mm) layers. Form a smooth, compact concave joint to match existing.
- G. Moist cure for 72 hours.

3.08 AGING

- A. Rub in new masonry work to match, as close as possible, adjacent original work.
 - 1. Use carbon black in small amounts, rubbing in well with burlap rags.
- B. After each application, dust off surplus and wash down with low pressure hose. Allow surface to dry before proceeding with succeeding applications.
- C. Continue process until acceptance.

3.09 CLEANING

- A. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.
- B. Remove excess mortar, smears, and droppings as work proceeds and upon completion.
- C. Clean surrounding surfaces.

END OF SECTION

SECTION 040511 MASONRY MORTARING AND GROUTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Mortar for masonry.
- B. Grout for masonry.

1.02 RELATED REQUIREMENTS

- A. Section 040100 - Maintenance of Masonry: Bedding and pointing mortar for masonry restoration work.
- B. Section 042000 - Unit Masonry: Installation of mortar and grout.
- C. Section 042300 - Glass Unit Masonry: Installation of mortar.
- D. Section 042600 - Single-Wythe Unit Masonry: Installation of mortar and grout.
- E. Section 042613 - Masonry Veneer: Installation of mortar.
- F. Section 042723 - Cavity Wall Unit Masonry: Installation of mortar and grout.
- G. Section 081113 - Hollow Metal Doors and Frames: Products and execution for grouting steel door frames installed in masonry.
- H. Section 081213 - Hollow Metal Frames: Products and execution for grouting steel door frames installed in masonry.

1.03 REFERENCE STANDARDS

- A. ASTM C5 - Standard Specification for Quicklime for Structural Purposes; 2018.
- B. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.
- C. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2024.
- D. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
- E. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- F. ASTM C157/C157M - Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete; 2017.
- G. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
- H. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
- I. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.
- J. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- K. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2023.
- L. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.
- M. ASTM C1019 - Standard Test Method for Sampling and Testing Grout for Masonry; 2020.
- N. ASTM C1072 - Standard Test Methods for Measurement of Masonry Flexural Bond Strength; 2022.
- O. ASTM C1260 - Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method); 2021.
- P. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2023b.
- Q. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.

- R. ASTM D5084 - Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter; 2016a.
- S. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry; 2020.
- T. ASTM E518/E518M - Standard Test Methods for Flexural Bond Strength of Masonry; 2022.
- U. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used. Also include required environmental conditions and admixture limitations.
- C. Samples: Submit two samples of mortar, illustrating mortar color and color range.
- D. Reports: Submit reports on mortar indicating compliance of mortar to property requirements of ASTM C270 and test and evaluation reports per ASTM C780.
- E. Reports: Submit reports on grout indicating compliance of component grout materials to requirements of ASTM C476 and test and evaluation reports to requirements of ASTM C1019.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions.

1.05 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
 - 1. Maintain one copy of each document on project site.

1.06 PRECONSTRUCTION TESTING

- A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 014000 - Quality Requirements.
- B. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.
 - 1. Test results will be used to establish optimum mortar proportions and establish quality control values for construction testing.
- C. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures.
 - 1. Test results will be used to establish optimum grout proportions and establish quality control values for construction testing.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.08 FIELD CONDITIONS

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.
- B. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.
- C. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS

- A. At Contractor's option, mortar and grout may be field-mixed from packaged dry materials, made from factory premixed dry materials with addition of water only, or ready-mixed.
- B. Use only ready-mixed mortar and grout, produced in on-site plant.
- C. Use only factory premixed packaged dry materials for mortar and grout, with addition of water only at project site.
- D. Field-mix all mortar and grout.
- E. Mortar Color: Natural gray unless otherwise indicated.
- F. Mortar Mix Designs: ASTM C270, Property Specification.
 - 1. Masonry below grade and in contact with earth: Type S.
 - 2. Exterior Cavity Walls: Type S mortar with Type N pointing mortar.
 - 3. Exterior, Non-loadbearing Masonry: Type N.
 - 4. Exterior Repointing Mortar: Type N with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
 - 5. Pointing Mortar for Prefaced or Specially Faced Unit Masonry: One part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate equal to 2 percent of Portland cement by weight.
 - 6. Glass Unit Masonry: Type N mortar and Type O pointing mortar.
- G. Grout Mix Designs:
 - 1. Bond Beams and Lintels: 3,000 psi (21 MPa) strength at 28 days; 8-10 inches (200-250 mm) slump; provide premixed type in accordance with ASTM C 94/C 94M.
 - a. Fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less.

2.02 MATERIALS

- A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
 - 1. Type: Type N.
 - 2. Color: Standard gray.
 - 3. Water repellent mortar for use with water repellent masonry units.
 - 4. Manufacturers:
 - a. Amerimix, an Oldcastle brand; AMX 400 Portland Lime Mortar Mix: www.amerimix.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- B. Portland Cement: ASTM C150/C150M.
 - 1. Type: Type I - Normal; ASTM C150/C150M.
 - 2. Color: Standard gray.
 - 3. Manufacturers:
 - a. Solomon Colors; Solomon Colors Concentrated A, H, and X Series: www.solomoncolors.com/#sle.
- C. Masonry Cement: ASTM C91/C91M.
 - 1. Type: Type N; ASTM C91/C91M.
 - 2. Colored Mortar: Premixed cement as required to match Architect's color sample.
 - 3. Manufacturers:
 - a. Solomon Colors; Solomon Colors Concentrated A, H, and X Series: www.solomoncolors.com/#sle.
- D. Hydrated Lime: ASTM C207, Type S.
- E. Grout Aggregate: ASTM C404.

- F. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
 - 1. Color(s): As indicated on drawings.
 - 2. Manufacturers:
 - a. Solomon Colors; Solomon Colors Concentrated A, H, and X Series: www.solomoncolors.com/#sle.
- G. Water: Clean and potable.
- H. Accelerating Admixture: Nonchloride type for use in cold weather.
 - 1. Substitutions: See Section 016000 - Product Requirements.
- I. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.
- J. Bonding Agent: Latex type.
- K. Integral Water Repellent Admixture: Polymeric liquid admixture added to mortar at the time of manufacture.
 - 1. Performance of Mortar with Integral Water Repellent:
 - a. Water Permeance: When tested per ASTM E514/E514M and for a minimum of 72 hours:
 - 1) No water visible on back of wall above flashing at the end of 24 hours.
 - 2) No flow of water from flashing equal to or greater than 0.032 gallons per hour (0.05 L per hour) at the end of 24 hours.
 - 3) No more than 25 percent of wall area above flashing visibly damp at end of test.
 - b. Flexural Bond Strength: ASTM C1072; minimum 10 percent increase.
 - c. Compressive Strength: ASTM C1314; maximum 5 percent decrease.
 - 2. Use only in combination with masonry units produced with integral water repellent admixture.
- L. Water-Repellent and Efflorescence-Control Mortar Mixture: Blended emulsion additive used in water-penetration-resistant and efflorescence-controlled masonry mortar.
 - 1. Products:
 - a. Master Builders Solutions; MasterPel Series: www.master-builders-solutions.com/en-us/#sle.

2.03 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- D. Do not use anti-freeze compounds to lower the freezing point of mortar.
- E. If water is lost by evaporation, re-temper only within two hours of mixing.

2.04 GROUT MIXING

- A. Mix grout in accordance with ASTM C94/C94M.
- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.
- C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- D. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 EXECUTION

3.01 PREPARATION

- A. Apply bonding agent to existing concrete surfaces.
- B. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.

3.02 INSTALLATION

- A. Install mortar and grout to requirements of section(s) in which masonry is specified.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not install grout in lifts greater than 16 inches (400 mm) without consolidating grout by rodding.
- D. Do not displace reinforcement while placing grout.
- E. Remove excess mortar from grout spaces.

3.03 GROUTING

- A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of Contract Documents.
- B. Low-Lift Grouting:
 - 1. Limit height of pours to 12 inches (300 mm).
 - 2. Limit height of masonry to 16 inches (400 mm) above each pour.
 - 3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
 - 4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
- C. High-Lift Grouting:
 - 1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
 - 2. Place grout for spanning elements in single, continuous pour.

3.04 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field tests, in accordance with provisions of Section 014000 - Quality Requirements.
- B. Test and evaluate mortar in accordance with ASTM C780 procedures.
- C. Test and evaluate grout in accordance with ASTM C1019 procedures.

3.05 SCHEDULES

- A. Exterior Cavity Wall: Type S mortar with Type N pointing mortar.
- B. Conference Room 102: Glass Unit Masonry with Type N mortar and Type O pointing mortar.

END OF SECTION

SECTION 042000 UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete block.
- B. Common brick.
- C. Mortar and grout.
- D. Reinforcement and anchorage.
- E. Flashings.
- F. Lintels.
- G. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 031000 - Concrete Forming and Accessories: Dovetail slots for masonry anchors.
- B. Section 032000 - Concrete Reinforcing: Reinforcing steel for grouted masonry.
- C. Section 033000 - Cast-in-Place Concrete: Installation of dovetail slots for masonry anchors.
- D. Section 040100 - Maintenance of Masonry.
- E. Section 040511 - Masonry Mortaring and Grouting.
- F. Section 042300 - Glass Unit Masonry.
- G. Section 055000 - Metal Fabrications: Loose steel lintels.
- H. Section 061000 - Rough Carpentry: Nailing strips built into masonry.
- I. Section 072700 - Air Barriers: Air barriers applied to exterior face of backing sheathing or unit masonry substrate.
- J. Section 076200 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
- K. Section 078400 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.
- L. Section 079200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019.
- D. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.
- E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.
- F. ASTM C62 - Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale); 2023.
- G. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2023.
- H. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.
- I. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2023.

- J. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2023a.
- K. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- L. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
- M. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- N. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2023.
- O. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2019).
- P. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry; 2020.
- Q. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.
- R. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.
- S. BIA Technical Notes No. 28B - Brick Veneer/Cold-Formed Steel Framed Walls; 2025.
- T. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.
- U. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).
- V. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for brickwork support system.
 - 1. Include calculations or selections from the manufacturer's prescriptive design tables that indicate compliance with the applicable building code and project conditions.
 - 2. Include the design engineer's stamp or seal on each sheet of shop drawings.
- D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
- E. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.
- F. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.
- G. Manufacturer's Qualification Statement.
- H. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
 - 1. Maintain one copy of each document on project site.
- B. Fire Rated Assemblies: Comply with applicable code for UL (FRD) Assembly No. ____.
- C. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.

- D. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 MOCK-UPS

- A. Construct a masonry wall as a mock-up panel sized 8 feet (2.4 m) long by 6 feet (1.8 m) high; include mortar, accessories, structural backup, and flashings (with lap joint, corner, and end dam) in mock-up.
- B. Locate where directed.
- C. Mock-up may remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depth of 8 inches (200 mm).
 2. Load-Bearing Units: ASTM C90, normal weight.
 - a. Hollow block, as indicated.
 - b. Pattern: Vertical single score.
 - c. Manufacturers:
 - 1) The Concrete Products Group; Spec-Brik: www.concreteproductsgroup.com/#sle.
 - 2) Substitutions: See Section 016000 - Product Requirements.
 3. Nonloadbearing Units: ASTM C129.
 - a. Hollow block, as indicated.
 - b. Lightweight.

2.02 BRICK UNITS

- A. Manufacturers:
1. Endicott Clay Products Co; Face Brick - FBX: www.endicott.com/#sle.
 2. Meridian Brick LLC; Athens Architectural Series: www.meridianbrick.com/#sle.
 3. Substitutions: See section 016000 - Product Requirements.
- B. Building (Common) Brick: ASTM C62, Grade SW; solid units.
1. Nominal size: As indicated on drawings.

2.03 MORTAR AND GROUT MATERIALS

- A. Mortar and Grout: As specified in Section 040511.

2.04 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers:
1. FEROC Corporation; FEROC FAST Soffit Concealer: www.ferocorp.com/#sle.
 2. Hohmann & Barnard, Inc; X-Seal Anchor: www.h-b.com/#sle.
 3. TruFast Walls, a division of Altenloh, Brinck & Co. US, Inc; Thermal-Grip MVA: www.trufastwalls.com/#sle.
 4. Substitutions: See Section 016000 - Product Requirements.
- B. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa), deformed billet bars; galvanized.
- C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.
- D. Single Wythe Joint Reinforcement: ASTM A951/A951M.
1. Type: Truss or ladder.

2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
3. Size: 0.1483 inch (3.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.
- E. Strap Anchors: Bent steel shapes, 1-1/2 inch (38 mm) width, 0.105 inch (2.7 mm) thick, 24 inch (610 mm) length, with 1-1/2 inch (38 mm) long, 90 degree bend at each end to form a U or Z shape or with cross pins, hot dip galvanized to ASTM A153/A153M Class B.
- F. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not less than 5/8 inch (16 mm) of mortar coverage from masonry face.
 1. Concrete frame: Dovetail anchors of bent steel strap, nominal 1 inch (25 mm) width x 0.024 in (0.61 mm) thick, with corrugated strap ties of nominal 1 inch (25 mm) width and 0.075 inch (1.91 mm) thick, hot dip galvanized to ASTM A 153/A 153M, Class B.
 2. Steel frame: Crimped wire anchors for welding to frame, 0.25 inch (6.3 mm) thick, with trapezoidal wire ties 0.1875 inch (4.75 mm) thick, hot dip galvanized to ASTM A 153/A 153M, Class B.
- G. Two-Piece Wall Ties: Formed steel wire, 0.1875 inch (4.8 mm) thick, adjustable, eye and pintle type, hot dip galvanized to ASTM A 153/A 153M, Class B, sized to provide not less than 5/8 inch (16 mm) of mortar coverage from masonry face and to allow vertical adjustment of up to 1-1/4 in (32 mm).
- H. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
 1. Anchor plates: Not less than 0.075 inch (1.91 mm) thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
 2. Wire ties: Manufacturer's standard shape, 0.1875 inch (4.75 mm) thick.
 3. Vertical adjustment: Not less than 3-1/2 inches (89 mm).
- I. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws; corrosion resistant finish or hot dip galvanized to ASTM A153/A153M.
 1. Manufacturers:
 - a. Substitutions: See Section 016000 - Product Requirements.

2.05 FLASHINGS

- A. Membrane Asphaltic Flashing Materials:
 1. Rubberized Asphalt Flashing: Self-adhering polymer modified asphalt sheet; 40 mils (0.040 inch) (1.0 mm) minimum total thickness; 8 mil (0.20 mm) cross-laminated polyethylene bonded to adhesive rubberized asphalt, with a removable release liner.
 - a. Manufacturers:
 - 1) Advanced Building Products, Inc; Strip-N-Flash: www.advancedbuildingproducts.com/#sle.
 - 2) Substitutions: See Section 016000 - Product Requirements.
- B. Membrane Non-Asphaltic Flashing Materials:
 1. Composite Polymer Flashings - Self-Adhering: Composite polyethylene; 40 mil (1.0 mm) thick with pressure-sensitive butyl adhesive and release paper.
 - a. Manufacturers:
 - 1) 3GEN Masonry Products; GENFLASH: www.3genmp.com/#sle.
 - 2) Hohmann & Barnard, Inc; Textroflash: www.h-b.com/#sle.
 - 3) WIRE-BOND; MAS-N-FLASH S.A.: www.wirebond.com/#sle.
 - 4) Substitutions: See Section 016000 - Product Requirements.
- C. Factory-Fabricated Flashing Corners and End Dams: Stainless steel.
 1. Manufacturers:
 - a. Mortar Net Solutions; CompleteFlash: www.mortarnet.com/#sle.

- b. Substitutions: See Section 016000 - Product Requirements.
- D. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.
 - 1. Manufacturers, Synthetic Rubber Products:
 - a. Substitutions: See Section 016000 - Product Requirements.
 - 2. Manufacturers, Modified Polyether Products:
 - a. Substitutions: See Section 016000 - Product Requirements.
- E. Drip Edge: Stainless steel; angled drip with hemmed edge; compatible with membrane and adhesives.
 - 1. Manufacturers:
 - a. Mortar Net Solutions; Metal Drip Edges: www.mortarnet.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.06 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
 - 1. Manufacturers:
 - a. Blok-Lok Limited; _____: www.blok-lok.com/#sle.
 - b. Hohmann & Barnard, Inc; _____: www.h-b.com/#sle.
 - c. WIRE-BOND; _____: www.wirebond.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.
 - 1. Manufacturers:
 - a. Hohmann & Barnard, Inc; _____: www.h-b.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- C. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
 - 1. Full-Height Airspace Maintenance and Drainage Material: Mesh panels fitted between masonry ties.
 - a. Drainage Material Thickness: 3/8 inch (9.5 mm).
 - b. Manufacturers:
 - 1) Advanced Building Products, Inc; Mortairvent-CW: www.advancedbuildingproducts.com/#sle.
 - 2) CavClear, a Division of Archovations Inc; CavClear Masonry Mat: www.cavclear.com/#sle.
 - 3) Substitutions: See Section 016000 - Product Requirements.
- D. Weeps:
 - 1. Type: Polyester mesh.
 - 2. Manufacturers:
 - a. Masonry Technology, Inc; Cavity Weep: www.mtidry.com/#sle.
 - b. Mortar Net Solutions; WeepVent: www.mortarnet.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
- E. Cavity Vents:
 - 1. Type: Preformed aluminum vents with sloping louvers.
 - 2. Manufacturers:
 - a. 3GEN Masonry Products; _____: www.3genmp.com.
 - b. Blok-Lok Limited; _____: www.blok-lok.com/#sle.
 - c. Mortar Net Solutions; CellVent: www.mortarnet.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.

- F. Drainage Fabric: Polyester or polypropylene mesh bonded to a water and vapor-permeable fabric.
 - 1. Manufacturers:
 - a. Advanced Building Products, Inc; Mortairvent: www.advancedbuildingproducts.com/#sle.
 - b. Mortar Net Solutions; DriPlane: www.mortarnet.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
- G. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.07 LINTELS

- A. Prefabricated Steel Lintels:
- B. Brickwork Support System: Offset steel relief angles or lintels with hanger brackets for support of brickwork above horizontal masonry joints and openings to allow insulation to span continuously behind brick and eliminate continuous thermal bridges associated with support systems that interrupt continuous insulation.
 - 1. Configuration: Relief angle or lintel with welded hanger brackets anchored to structure.
 - 2. Sizes: Component and anchor sizes and spacing to be determined by manufacturer from calculations or prescriptive design tables to suit project loading conditions and cavity width indicated on drawings.
 - 3. Materials: Steel, hot dip galvanized to ASTM A153/A153M class B.
 - 4. Manufacturers:
 - a. FERO Corporation; FERO FAST Thermal Bracket Offset Shelf Angle - STANDARD: www.ferocorp.com/#sle.
 - b. Hohmann & Barnard, Inc; TBS - Thermal Brick System: www.h-b.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

3.04 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches (200 mm).
 - 3. Mortar Joints: Concave.
- D. Brick Units:

1. Bond: Running.
2. Coursing: Three units and three mortar joints to equal 8 inches (200 mm).
3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar and mortar smears as work progresses.
- E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
- F. Interlock intersections and external corners, except for units laid in stack bond.
- G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- I. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- J. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- K. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 WEEPS/CAVITY VENTS

- A. Install weeps in veneer and cavity walls at 24 inches (600 mm) on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.
- B. Install cavity vents in veneer and cavity walls at 32 inches (800 mm) on center horizontally below shelf angles and lintels and near top of walls.

3.07 CAVITY MORTAR CONTROL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
- B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.
- C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions.
 1. Verify that airspace width is no more than 3/8 inch (9 mm) greater than panel thickness.
 2. Hold cavity mortar control panel tight to face wythe.
 3. Install horizontally between joint reinforcement.
 4. Stagger end joints in adjacent rows.
 5. Fit to perimeter construction and penetrations without voids.
- D. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.08 REINFORCEMENT AND ANCHORAGE - GENERAL, SINGLE WYTHER MASONRY, AND CAVITY WALL MASONRY

- A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches (400 mm) on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.

- D. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch (16 mm) mortar cover on each side.
- E. Lap joint reinforcement ends minimum 6 inches (150 mm).
- F. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches (400 mm) on center.
- G. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches (900 mm) horizontally and 24 inches (600 mm) vertically.
- H. Embed ties and anchors in mortar joint and extend into masonry unit a minimum of 1-1/2 inches (38 mm) with at least 5/8 inch (16 mm) mortar cover to the outside face of the anchor.

3.09 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches (400 mm) on center vertically and 36 inches (900 mm) on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches (200 mm) on center.
- B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches (400 mm) on center vertically and 24 inches (600 mm) on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches (200 mm) on center.

3.10 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - 1. Extend flashings full width at such interruptions and at least 6 inches (152 mm), minimum, into adjacent masonry or turn up flashing ends at least 1 inch (25.4 mm), minimum, to form watertight pan at nonmasonry construction.
 - 2. Remove or cover protrusions or sharp edges that could puncture flashings.
 - 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Terminate flashing up 8 inches (203 mm) minimum on vertical surface of backing:
 - 1. Install vertical leg of flashing behind water-resistive barrier sheet over backing.
 - 2. Install vertical leg of flashing over fluid-applied or self-adhered air/vapor barriers over backing or per manufacturer's directions.
 - 3. Terminate vertical leg of flashing into bed joint in masonry or reglet in concrete.
 - 4. Anchor vertical leg of flashing into backing with a termination bar and sealant.
 - 5. Apply cap bead of sealant on top edge of self-adhered flashing.
- C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.
- D. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.
- E. Extend metal flashings to within 1/2 inch (12 mm) of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.
- F. Support flexible flashings across gaps and openings.
- G. Extend plastic, laminated, EPDM, and _____ flashings to within 1/2 inch (12 mm) of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.
- H. Lap end joints of flashings at least 6 inches (152 mm), minimum, and seal watertight with flashing sealant/adhesive.

3.11 LINTELS

- A. Install loose steel lintels over openings.
- B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

1. Openings to 42 inches (1070 mm): Place two, No. 3 (M9) reinforcing bars 1 inch (25 mm) from bottom web.
 2. Openings from 42 inches (1070 mm) to 78 inches (1980 mm): Place two, No. 5 (M16) reinforcing bars 1 inch (25 mm) from bottom web.
 3. Openings over 78 inches (1980 mm): Reinforce openings as detailed.
 4. Do not splice reinforcing bars.
 5. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.
 6. Place and consolidate grout fill without displacing reinforcing.
 7. Allow masonry lintels to attain specified strength before removing temporary supports.
- C. Maintain minimum ____ inch (____ mm) bearing on each side of opening.
- D. Install thermal brick support system in accordance with manufacturer's instructions at locations indicated on drawings

3.12 GROUTED COMPONENTS

- A. Lap splices minimum 24 bar diameters.
- B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.
- C. Place and consolidate grout fill without displacing reinforcing.

3.13 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control or expansion joints.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- C. Form expansion joint as detailed on drawings.

3.14 TOLERANCES

- A. Install masonry within the site tolerances found in TMS 402/602.
- B. Maximum Variation from Alignment of Columns: 1/4 inch (6 mm).
- C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch (1.6 mm).
- D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft (6 mm/3 m) and 1/2 inch in 20 ft (13 mm/6 m) or more.
- E. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.
- F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft (3 mm/m) and 1/4 inch in 10 ft (6 mm/3 m); 1/2 inch in 30 ft (13 mm/9 m).
- G. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch (minus 6.4 mm, plus 9.5 mm).
- H. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch (6 mm).

3.15 CUTTING AND FITTING

- A. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.16 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - Quality Requirements.
- B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for compliance with requirements of this specification.
- C. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.17 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

3.18 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 042200 CONCRETE UNIT MASONRY

SECTION 04 22 00 - CONCRETE UNIT MASONRY

PART 1 GENERAL

2.01 REFERENCE STANDARDS

- A. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- B. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.
- C. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement; 2024.
- D. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2023.
- E. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.
- F. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- G. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
- H. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- I. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
- J. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
- K. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.
- L. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- M. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).
- N. ASTM C549 - Standard Specification for Perlite Loose Fill Insulation; 2023.
- O. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- P. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2023.
- Q. ASTM C1019 - Standard Test Method for Sampling and Testing Grout for Masonry; 2020.
- R. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2023b.
- S. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017 (Reapproved 2023).
- T. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber; 2020.
- U. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications; 2018, with Editorial Revision (2024).
- V. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- W. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

2.02 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Mortar and grout materials.
 - 3. Reinforcement.
 - 4. Masonry-joint reinforcement.

5. Embedded flashing materials.
6. Miscellaneous masonry accessories.
7. Masonry-cell insulation.

2.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

2.04 ACTION SUBMITTALS

- A. Product data.
- B. Shop Drawings: For the following: Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.

2.05 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Material certificates.
- C. Mix designs.
- D. Statement of compressive strength of masonry.

2.06 QUALITY ASSURANCE

- A. Project team craftworkers of the Masonry Contractor assigned to Project will be required to have the International Masonry Institute - Flashing Training or equal and to provide evidence of certificate or a letter of the firm's commitment to enroll key project personnel in the training program prior to the start of Project.
- B. Project team craftworkers of the Masonry Contractor assigned to Project will be required to have the International Masonry Institute - Grouting and Reinforcing Training or equal and to provide evidence of certificate or a letter of the firm's commitment to enroll key project personnel in the training program prior to the start of Project.

PART 2 PRODUCTS

3.01 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops indicated net-area compressive strengths at 28 days.
 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) in accordance with Tables 1 and 2 inch (50.8 mm) TMS 402/602.
- B. Regulatory Requirements: Comply with the provisions of the following codes, specifications, and standards, except as otherwise shown or specified:
 1. TMS 402/602.

3.02 CONCRETE UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 402/602 except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.
- C. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- D. Building Lintels:
 1. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout.
 - a. Knockout blocks will not be acceptable.

- E. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing in accordance with ASTM E119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

3.03 CONCRETE MASONRY UNITS

- A. Standard CMUs: Load-bearing ASTM C90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi (14823.73 kPa).
 - 2. Density Classification: Normal weight.
 - 3. Size (Width): Manufactured to dimensions 3/8 inch (9.52 mm) less-than-nominal dimensions.

3.04 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Masonry Cement: ASTM C91/C91M.
 - 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. Cemex S.A.B. de C.V.
 - b. Heidelberg Materials.
 - c. Lafarge North America Inc.
- D. Aggregate for Mortar: ASTM C144.
 - 1. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 2. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- E. Aggregate for Grout: ASTM C404.
- F. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition 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. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - b. GCP Applied Technologies Inc.
- G. Water: Potable.

3.05 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars 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. Heckmann Building Products, Inc.
 - b. Wire-Bond.
- C. Masonry-Joint Reinforcement, General: Ladder type complying with ASTM A951/A951M.
 - 1. Interior Walls: Hot-dip galvanized carbon steel.
 - 2. Wire Size for Side Rods: 0.148-inch diameter.

3. Wire Size for Cross Rods: 0.148-inch diameter.
4. Spacing of Cross Rods: Not more than 16 inches o.c.
5. Provide in lengths of not less than 10 feet (304.8 cm).

3.06 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).
- D. Masonry Cleaners:
 1. Proprietary Acidic Masonry Cleaner: Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry units being cleaned.
 - 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) Diedrich Technologies, Inc.; a Hohmann & Barnard company.
 - 2) EaCo Chem, Inc.

3.07 MASONRY-CELL INSULATION

- A. Masonry-Cell Fill: Loose-fill insulation, perlite complying with ASTM C549, Type II (surface treated for water repellency and limited moisture absorption) or Type IV (surface treated for water repellency and to limit dust generation).
- B. Molded-Polystyrene Insulation Units: CMU units with molded rigid expandable polystyrene-inserts to comply with ASTM C578, Type 1. Provide insulated block units designed for installing in cores of masonry units.

3.08 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 portland cement-lime masonry cement or mortar cement mortar unless otherwise indicated.
- B. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
 1. For reinforced masonry, use Type S.
 2. For interior non-load-bearing partitions, Type O may be used instead of Type N.
- C. Grout for Unit Masonry: Comply with ASTM C476.
 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 402/602 for dimensions of grout spaces and pour height.
 2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (13789.52 kPa).
 3. Provide grout with a slump of 8 to 11 inches as measured in accordance with ASTM C143/C143M.

PART 3 EXECUTION

4.01 INSTALLATION, GENERAL

- A. 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.
- B. Exposed Masonry: Mix units to product uniform blend of colors and textures.
- C. Where existing masonry occurs, match coursing, bonding, color, and texture of existing masonry.
- D. Temperature Control: Perform temperature-sensitive construction procedures while masonry Work is progressing. Temperature ranges vary at time of installation, except for grout. For grout, temperature ranges apply to anticipated minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10 deg F.
- E. Masonry Protection: Protect completed masonry and masonry not being worked by the required day and night anticipated minimum air temperatures.

4.02 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 (12.7 mm) or minus 1/4 inch (6.35 mm).
 - 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12.7 mm).
 - 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6.35 mm) in a story height or 1/2 inch (12.7 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 (6.35 mm) in 10 feet (304.8 cm), or 1/2 inch (12.7 mm) maximum.
 - 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch (3.18 mm) in 10 feet (304.8 cm), 1/4 inch (6.35 mm) in 20 feet (609.6 cm), or 1/2 inch (12.7 mm) maximum.
 - 3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch (6.35 mm) in 10 feet (304.8 cm), 3/8 inch (9.52 mm) in 20 feet (609.6 cm), or 1/2 inch (12.7 mm) maximum.
 - 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch (3.18 mm) in 10 feet (304.8 cm), 1/4 inch (6.35 mm) in 20 feet (609.6 cm), or 1/2 inch (12.7 mm) maximum.
 - 5. For lines and surfaces, do not vary from straight by more than 1/4 inch (6.35 mm) in 10 feet (304.8 cm), 3/8 inch (9.52 mm) in 20 feet (609.6 cm), or 1/2 inch (12.7 mm) maximum.
- C. Joints:
 - 1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3.18 mm), with a maximum thickness limited to 1/2 inch (12.7 mm).
 - 2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3.18 mm).
 - 3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9.52 mm) or minus 1/4 inch (6.35 mm).
 - 4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3.18 mm).

4.03 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. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- C. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- D. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- E. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

4.04 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
 - 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
 - 3. Bed webs in mortar in grouted masonry, including starting course on footings.
 - 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- C. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

4.05 MASONRY-CELL FILL INSTALLATION

- A. Pour insulation materials into cavities to fill void spaces. Maintain inspection ports to show presence of fill at extremities of each pour area. Close the ports after filling has been confirmed. Limit the fall of fill to one story high, but not more than 20 feet (609.6 cm).
- B. Install molded-polystyrene insulation units into masonry unit cells before laying units.

4.06 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (15.88 mm) on exterior side of walls, 1/2 inch (12.7 mm) elsewhere. Lap reinforcement a minimum of 6 inches.
 - 1. Space reinforcement not more than 16 inches o.c.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

4.07 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
 - 1. Provide an open space not less than 1 inch (25.4 mm) wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

4.08 CONTROL JOINTS

- A. General: Install control joint materials in CMUs as masonry progresses. Do not allow materials to span control joints without provision to allow for in-plane wall or partition movement.
- B. Locate control joints. Comply with NCMA TEK 10-02D.

4.09 LINTELS

- A. Install lintels over openings as indicated.

- B. Provide concrete or formed-in-place masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.
- C. Lintels at Fire-Rated Openings: Provide fire-rated masonry required or steel lintels with applied fireproofing in thickness required to maintain fire rating of wall or partition rating.

4.10 REINFORCED UNIT MASONRY

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 402/602.
- C. 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 TMS 402/602 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.

4.11 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements is done at Contractor's expense.
- B. Testing Prior to Construction: One set of tests.
- C. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
- D. Concrete Masonry Unit Test: For each type of unit provided, in accordance with ASTM C140 for compressive strength.
- E. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, in accordance with ASTM C780.
- F. Mortar Test (Property Specification): For each mix provided, in accordance with ASTM C780. Test mortar for compressive strength.
- G. Grout Test (Compressive Strength): For each mix provided, in accordance with ASTM C1019.
- H. Prism Test: For each type of construction provided, in accordance with ASTM C1314 at 28 days.

4.12 PARGING

- A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of 3/4 inch (19.05 mm). Dampen wall before applying first coat, and scarify first coat to ensure full bond to subsequent coat.
- B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch (3.18 mm) per foot. Form a wash at top of parging and a cove at bottom.
- C. Damp-cure parging for at least 24 hours and protect parging until cured.

4.13 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. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.

END OF SECTION

**SECTION 042300
GLASS UNIT MASONRY**

PART 2 PRODUCTS

END OF SECTION

**SECTION 042600
SINGLE-WYTHE UNIT MASONRY**

PART 2 PRODUCTS

END OF SECTION

**SECTION 042723
CAVITY WALL UNIT MASONRY**

PART 2 PRODUCTS

END OF SECTION

**SECTION 047100
MANUFACTURED BRICK MASONRY**

PART 2 PRODUCTS

1.01 ADHERED MANUFACTURED BRICK MASONRY VENEER (AMBMV)

- A. AMBMV: Cast masonry units using a mixture of cement, lightweight aggregates, concrete additives and color pigments to replicate appearance of brick and designed to be applied with a cementitious mortar to a backing surface, complying with ASTM C1670/C1670M and ICC-ES AC51.

1.02 MORTAR APPLICATIONS

END OF SECTION

SECTION 050300
CONSERVATION TREATMENT FOR PERIOD METALS

PART 2 PRODUCTS

END OF SECTION

SECTION 050513.11
SHOP-APPLIED ANODIZED LAYER FOR ALUMINUM - LORIN INDUSTRIES

PART 2 PRODUCTS

1.01 ANODIC LAYER SUPPLIER

- A. Lorin Industries, Inc: www.lorin.com/#sle.

1.02 MATERIALS

- A. General: Provide sheet metal without pitting, seam marks, roller marks, stains, discolorations, or other imperfections exposed to view on finished units.

END OF SECTION

SECTION 051200 STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022, with Errata (2025).
- B. AISC 360 - Specification for Structural Steel Buildings; 2022, with Errata (2025).
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- G. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2022.
- H. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
- I. ASTM E165/E165M - Standard Practice for Liquid Penetrant Testing for General Industry; 2023.
- J. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2024.
- K. ASTM F959/F959M - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series; 2017a.
- L. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.
- M. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025.
- N. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.
- O. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- P. SSPC-SP 3 - Power Tool Cleaning; 2024.

1.02 SUMMARY

- A. Section Includes:
 - 1. Structural steel.
 - 2. Shear stud connectors, shop welded.
 - 3. Shrinkage-resistant grout.
- B. Related Requirements:
 - 1. Section 05 12 13 "Architecturally Exposed Structural Steel Framing" for additional requirements for architecturally exposed structural steel.

1.03 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

1.04 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.05 ACTION SUBMITTALS

- A. Product Data:
 - 1. Structural-steel materials.
 - 2. High-strength, bolt-nut-washer assemblies.
 - 3. Anchor rods.
 - 4. Threaded rods.
 - 5. Shop primer.
 - 6. Galvanized-steel primer.
 - 7. Etching cleaner.
 - 8. Galvanized repair paint.
 - 9. Shrinkage-resistant grout.
- B. Shop Drawings: Show fabrication of structural-steel components.
- C. Delegated Design Submittal: For structural-steel connections indicated on Drawings to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.06 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Mill test reports for structural-steel materials, including chemical and physical properties.
- C. Source quality-control reports.
- D. Field quality-control reports.

1.07 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents:
 - 1. ANSI/AISC 303.
 - 2. ANSI/AISC 360.
 - 3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- B. Connection Design Information:
 - 1. Option 2: Fabricator's experienced steel detailer selects or completes connections in accordance with ANSI/AISC 303.
 - a. Select and complete connections using schematic details indicated and ANSI/AISC 360.
 - b. Use Allowable Stress Design; data are given at service-load level.
- C. Moment Connections: Type FR, fully restrained.
- D. Construction: Combined system of moment frame and braced frame.

2.02 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992/A992M.
- B. Channels, Angles: ASTM A36/A36M.
- C. Plate and Bar: ASTM A36/A36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade B structural tubing.
- E. Steel Pipe: ASTM A53/A53M, Type E or Type S, Grade B.
- F. Welding Electrodes: Comply with AWS requirements.

2.03 BOLTS AND CONNECTORS

- A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with plain finish.
- B. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
 - 1. Finish: Hot-dip or mechanically deposited zinc coating.
 - 2. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with mechanically deposited zinc coating, baked epoxy-coated finish.
- C. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125/F3125M, Grade F1852, Type 1, heavy-hex head assemblies, consisting of steel structural bolts with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
 - 1. Finish: Mechanically deposited zinc coating.

2.04 RODS

- A. Unheaded Anchor Rods: ASTM F1554, Grade 36.
 - 1. Configuration: Straight.
 - 2. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C.
- B. Headed Anchor Rods: ASTM F1554, Grade 36, straight.
 - 1. Finish: Plain.
- C. Threaded Rods: ASTM A36/A36M.
 - 1. Finish: Plain.

2.05 PRIMER

- A. Steel Primer:
 - 1. Comply with Section 09 91 13 "Exterior Painting" and Section 09 91 23 "Interior Painting."
 - 2. SSPC-Paint 23, latex primer.
 - 3. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- B. Galvanized-Steel Primer: MPI#26.
 - 1. Etching Cleaner: MPI#25, for galvanized steel.
 - 2. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

2.06 SHRINKAGE-RESISTANT GROUT

- A. Metallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, 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 C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.07 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

2.08 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Slip critical.

- 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.

2.09 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 (50.8 mm).
 - 2. Surfaces to be field welded.
 - 3. Surfaces of high-strength bolted, slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 - 5. Galvanized surfaces.
 - 6. Surfaces enclosed in interior construction.
- B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:
 - 1. SSPC-SP 3.
- C. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.0381 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.10 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform shop tests and inspections.
 - 1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
 - 2. Bolted Connections: Inspect and test shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 - 3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E165/E165M.
 - 4. Prepare test and inspection reports.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Baseplates Bearing Plates 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 shrinkage-resistant 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 grouting.
- C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

3.03 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
 - 1. Joint Type: Slip critical.
- 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 ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

END OF SECTION

SECTION 053100 STEEL DECKING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- C. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
- D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2024.
- E. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- F. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
- G. SDI QA/QC - Standard for Quality Control and Quality Assurance for Installation of Steel Deck; 2022.
- H. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.02 SUMMARY

- A. Section Includes:
 - 1. Roof deck.

1.03 ACTION SUBMITTALS

- A. Product Data:
 - 1. Roof deck.
- B. Shop Drawings:
 - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.04 INFORMATIONAL SUBMITTALS

- A. Certificates:
 - 1. Welding certificates.
 - 2. Product Certificates: For each type of steel deck.
- B. Test and Evaluation Reports:
 - 1. Product Test Reports: For tests performed by a qualified testing agency, indicating that power-actuated mechanical fasteners comply with requirements.
 - 2. Research Reports: For steel deck, from ICC-ES showing compliance with the building code.
- C. Field Quality-Control Submittals:
 - 1. Field quality-control reports.
- D. Qualification Statements: For welding personnel and testing agency.

1.05 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Welding Qualifications: Qualify procedures and personnel in accordance with SDI QA/QC and the following welding code:
 - a. AWS D1.3/D1.3M.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in accordance with SDI MOC3. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck in accordance with AISI S100.
- B. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from listings of another qualified testing agency.

2.02 ROOF DECK

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. New Millennium Building Systems, LLC.
 - 2. Roof Deck, Inc.
 - 3. Vulcraft Group; Division of Nucor Corp.
- B. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with SDI RD and with the following:
 - 1. Prime-Painted Steel Sheet: ASTM A1008/A1008M, Structural Steel (SS), Grade 33 minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
 - a. Color: Manufacturer's standard.
 - 2. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33, G60 zinc coating.
 - 3. Galvanized- and Shop-Primed Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33, G60 zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
 - a. Color: Manufacturer's standard.
 - 4. Deck Profile: As indicated.
 - 5. Profile Depth: 1-1/2 inches (38 mm).
 - 6. Design Uncoated-Steel Thickness: 0.0295 inch (0.75 mm).
 - 7. Span Condition: Triple span or more.
 - 8. Side Laps: Interlocking seam.

2.03 ACCESSORIES

- A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (227527.08 kPa), not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (227527.08 kPa), of same material and finish as deck, and of thickness and profile recommended by SDI standards for overhang and slab depth.
- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.

- H. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch (1.52 mm) thick, with factory-punched hole of 3/8-inch minimum diameter.
- I. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch (1.9 mm) thick, of same material and finish as deck. For drains, cut holes in the field.
- J. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B, with dry film containing a minimum of 94 percent zinc dust by weight.
- K. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

- A. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; manufacturer's written instructions; and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install in accordance with deck manufacturer's written instructions.

3.02 INSTALLATION OF ROOF DECK

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches (38 mm) long, and as follows:
 - 1. Weld Diameter: 5/8 inch (15.88 mm), nominal.
 - 2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated.
 - 3. Weld Washers: Install weld washers at each weld location.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 18 inches (457.2 mm), and as follows:
 - 1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
 - 2. Mechanically clinch or button punch.
 - 3. Fasten with a minimum of 1-1/2-inch-long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:
 - 1. End Joints: Lapped 2 inches (50.8 mm) minimum.
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches (304.8 mm) apart with at least one fastener at each corner.
 - 1. Install reinforcing channels or zees in ribs to span between supports and weld or mechanically fasten.

- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels in accordance with deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive in accordance with manufacturer's written instructions to ensure complete closure.

3.03 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.
- B. Repair Painting:
 - 1. Wire brush and clean rust spots, welds, and abraded areas on top surface of prime-painted deck immediately after installation, and apply repair paint.

END OF SECTION

SECTION 054000 COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
- B. AISI S200 - North American Standard for Cold-Formed Steel Framing - General Provisions; 2012.
- C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- G. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
- H. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- I. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- J. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel; 2021.
- K. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- L. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.
- M. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
- N. ASTM C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections; 2024.
- O. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- P. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2024.
- Q. ASTM F594 - Standard Specification for Stainless Steel Nuts; 2024.
- R. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.
- S. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.
- T. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
- U. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2018, with Editorial Revision (2020).
- V. ICC-ES AC58 - Acceptance Criteria for Adhesive Anchors in Cracked and Uncracked Masonry Elements; 2022.
- W. ICC-ES AC70 - Acceptance Criteria for Power-Actuated Fasteners Driven into Concrete, Steel and Masonry Elements; 2019, with Editorial Revision (2021).
- X. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2017, with Editorial Revision (2020).

- Y. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2023.
- Z. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.02 SUMMARY

- A. Section Includes:
 - 1. Load-bearing wall framing.
 - 2. Exterior non-load-bearing wall framing.
 - 3. Interior non-load-bearing wall framing.

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.04 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Cold-formed steel framing materials.
 - 2. Load-bearing wall framing.
 - 3. Exterior non-load-bearing wall framing.
 - 4. Interior non-load-bearing wall framing.
 - 5. Vertical deflection clips.
 - 6. Single deflection track.
 - 7. Double deflection track.
 - 8. Drift clips.
 - 9. Post-installed anchors.
 - 10. Power-actuated anchors.
- B. Shop Drawings:
 - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

1.05 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product certificates.
- C. Product test reports.
- D. Research Reports:
 - 1. For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.06 QUALITY ASSURANCE

- A. Product Tests: Mill certificates or data from a qualified independent testing agency.
- B. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
- D. Comply with AISI S230 "Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings."

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. AllSteel & Gypsum Products, Inc.
2. ClarkDietrich.
3. MRI Steel Framing, LLC.
4. Marino\WARE.
5. Steel Network, Inc. (The).

2.02 PERFORMANCE REQUIREMENTS

- A. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing complies with AISI S100 and AISI S240.
- B. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.03 COLD-FORMED STEEL FRAMING MATERIALS

- A. Framing Members, General: Comply with AISI S240 for conditions indicated.
- B. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
 1. Grade: As required by structural performance.
 2. Coating: G60, A60, AZ50, or GF30.
- C. Steel Sheet for Vertical Deflection Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:
 1. Grade: As required by structural performance.
 2. Coating: G60.

2.04 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: 1-5/8 inches (41 mm).
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and matching minimum base-metal thickness of steel studs.
- C. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges, and as follows:
 1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
 2. Flange Width: 1-5/8 inches (41 mm).

2.05 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: 1-5/8 inches (41 mm).
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.
- C. Vertical Deflection Clips, Exterior: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
 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. ClarkDietrich.
 - b. Marino\WARE.
 - c. Steel Network, Inc. (The).

- 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 loads and transfer them to the primary structure.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
- F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.06 INTERIOR 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: 0.0329 inch (0.84 mm).
 - 2. Flange Width: 1-5/8 inches (41 mm).
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.
- C. Vertical Deflection Clips, Interior: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
 - 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. ClarkDietrich.
 - b. Marino\WARE.
 - c. Simpson Strong-Tie Co., Inc.
- 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 loads and transfer them to the primary structure.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
- F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.07 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated.

2.08 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.
- B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by mechanically deposition according to ASTM B695, Class 50.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 ICC-ES AC193 ICC-ES AC58 or ICC-ES AC308 as appropriate for the substrate.
 - 1. Uses: Securing cold-formed steel framing to structure.

2. Type: Torque-controlled expansion anchor or adhesive anchor.
 3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
 4. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless steel bolts, ASTM F593, and nuts, ASTM F594.
- D. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

2.09 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A780/A780M MIL-P-21035B or SSPC-Paint 20.
- B. Cement Grout: Portland cement, ASTM C150/C150M, Type I; and clean, natural sand, ASTM C404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C1107/C1107M, and with a fluid consistency and 30-minute working time.
- D. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.
- E. Sill Sealer Gasket: Closed-cell neoprene foam, 1/4 inch (6.35 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.

PART 3 EXECUTION

3.01 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.
- C. Install load-bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch (6.35 mm) to ensure a uniform bearing surface on supporting concrete or masonry construction.
- D. Install sill sealer gasket at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.02 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
- D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- E. Install temporary bracing and supports to secure framing and support loads equal 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.

- F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- G. Install insulation, specified in Section 07 21 00 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- H. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.03 INSTALLATION OF LOAD-BEARING WALL FRAMING

- A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:
 - 1. Anchor Spacing: As shown on Shop Drawings.
- B. Squarely seat studs against top and bottom tracks, with gap not exceeding 1/8 inch (3.18 mm) between the end of wall-framing member and the web of track.
 - 1. Fasten both flanges of studs to top and bottom tracks.
 - 2. Space studs as follows:
 - a. Stud Spacing: 16 inches (406.4 mm).
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.
- D. Align studs vertically where floor framing interrupts wall-framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.
- E. Align floor and roof framing over studs according to AISI S200, Section C1. Where framing cannot be aligned, continuously reinforce track to transfer loads.
- F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure.
- G. Install headers over wall openings wider than stud spacing. Locate headers above openings. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
 - 1. Frame wall openings with not less than a double stud at each jamb of frame. Fasten jamb members together to uniformly distribute loads.
 - 2. Install tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.
- H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
 - 1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.
- I. Install horizontal bridging in stud system, spaced vertically as indicated on Shop Drawings. Fasten at each stud intersection.
 - 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of two screws into each flange of the clip angle for framing members up to 6 inches (152.4 mm) deep.
 - 2. Strap 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.
 - 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

- J. Install steel sheet diagonal bracing straps to both stud flanges; terminate at and fasten to reinforced top and bottom tracks. Fasten clip-angle connectors to multiple studs at ends of bracing and anchor to structure.
- K. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.04 INSTALLATION OF EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
 - 1. Stud Spacing: 16 inches (406.4 mm).
- 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 deep-leg deflection tracks and anchor to building structure.
 - 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 - 3. Connect vertical deflection clips to infill studs and anchor to building structure.
 - 4. Connect drift clips to cold-formed steel framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches (1219.2 mm) apart. Fasten at each stud intersection.
 - 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 - 2. Strap 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.
 - 3. Bar 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, and fasteners, to provide a complete and stable wall-framing system.

3.05 INSTALLATION OF INTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
 - 1. Stud Spacing: 16 inches (406.4 mm).
- 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 deep-leg deflection tracks and anchor to building structure.
 - 2. Connect vertical deflection clips to studs and anchor to building structure.
 - 3. Connect drift clips to cold-formed steel metal framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated but not more than 48 inches (1219.2 mm) apart. Fasten at each stud intersection.
 - 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.

2. Strap 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.
 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (304.8 mm) of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
1. Install solid blocking at 96-inch centers.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.06 INSTALLATION TOLERANCES

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch (3.18 mm) in 10 feet (304.8 cm) and as follows:
1. Space individual framing members no more than plus or minus 1/8 inch (3.18 mm) from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

3.07 REPAIRS

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

3.08 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION

SECTION 054400 COLD-FORMED METAL TRUSSES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. AISI S200 - North American Standard for Cold-Formed Steel Framing - General Provisions; 2012.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- D. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
- E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- F. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- G. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel; 2021.
- H. ASTM C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections; 2024.
- I. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- J. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025a.
- K. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.
- L. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.
- M. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
- N. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2018, with Editorial Revision (2020).
- O. ICC-ES AC58 - Acceptance Criteria for Adhesive Anchors in Cracked and Uncracked Masonry Elements; 2022.
- P. ICC-ES AC70 - Acceptance Criteria for Power-Actuated Fasteners Driven into Concrete, Steel and Masonry Elements; 2019, with Editorial Revision (2021).
- Q. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2017, with Editorial Revision (2020).
- R. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2023.
- S. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.02 SUMMARY

- A. Section Includes:
 - 1. Cold-formed steel roof trusses.
 - 2. Cold-formed steel floor trusses.

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.04 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Cold-formed steel truss materials.
 - 2. Anchor bolts.
 - 3. Post-installed anchors.
 - 4. Power-actuated fasteners.
 - 5. Mechanical fasteners.
- B. Shop Drawings:
 - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel trusses; fabrication; and fastening and anchorage details, including mechanical fasteners.
 - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- C. Delegated Design Submittals: For cold-formed steel trusses.

1.05 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product test reports.
- C. Research Reports: For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
- D. Field quality-control reports.

1.06 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified in accordance with ASTM E329 for testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 PRODUCTS

2.01 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. Alpine TrusSteel; an ITW company.
 - 2. MiTek Industries, Inc.
 - 3. USA Frametek.

2.02 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design cold-formed steel trusses.
- B. Structural Performance: Provide cold-formed steel trusses capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: As indicated on Drawings.
 - 2. Deflection Limits: Design trusses to withstand design loads without deflections greater than the following:
 - a. Roof Trusses: Vertical deflection of 1/360 of the span.
 - 3. Design trusses to provide for movement of truss members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
- C. Cold-Formed Steel Truss Standards: Unless more stringent requirements are indicated, trusses comply with the following:
 - 1. Floor and Roof Systems: AISI S210.

2. Lateral Design: AISI S213.
 3. Roof Trusses: AISI S214.
- D. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.03 COLD-FORMED STEEL TRUSS MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
1. Grade: As required by structural performance.
 2. Coating: G60, A60, AZ50, or GF30.

2.04 COLD-FORMED STEEL ROOF TRUSSES

- A. Roof Truss Members: Manufacturer's standard C-shaped steel sections.
1. Connecting Flange Width: 1-5/8 inches (41 mm), minimum at top and bottom chords connecting to sheathing or other directly fastened construction.
 2. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).

2.05 TRUSS ACCESSORIES

- A. Fabricate steel-truss accessories from steel sheet, ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for truss members.
- B. Provide accessories of manufacturer's standard thickness and configuration unless otherwise indicated.

2.06 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process in accordance with ASTM A123/A123M.
- B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by mechanical deposition in accordance with ASTM B695, Class 50.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 ICC-ES AC193 ICC-ES AC58 or ICC-ES AC308 as appropriate for the substrate.
1. Uses: Securing cold-formed steel trusses to structure.
 2. Type: Torque-controlled expansion anchor or adhesive anchor.
 3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
- D. Power-Actuated Fasteners: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

2.07 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A780/A780M MIL-P-21035B or SSPC-Paint 20.
- B. Shims: Load-bearing, high-density multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as truss members supported by shims.

PART 3 EXECUTION

3.01 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed steel trusses without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.

3.02 INSTALLATION

- A. Install bridge, and brace cold-formed steel trusses according to AISI S200, AISI S202, AISI S214, and manufacturer's written instructions unless more stringent requirements are indicated.
 - 1. Coordinate with wall framing to align webs of bottom chords and load-bearing studs or continuously reinforce track to transfer loads to structure.
 - 2. Install continuous bridging and permanently brace trusses as indicated on Shop Drawings and designed according to CFSEI's Technical Note 551e, "Design Guide: Permanent Bracing of Cold-Formed Steel Trusses." .
- B. Install cold-formed steel trusses and accessories true to line and location, and with connections securely fastened.
- C. Install temporary bracing and supports to secure trusses and support loads equal 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 trusses are secured.
- D. Truss Spacing: As indicated on Drawings.

3.03 ERECTION TOLERANCES

- A. Install cold-formed steel trusses level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch (3.18 mm) in 10 feet (304.8 cm) and as follows:
 - 1. Space individual trusses no more than plus or minus 1/8 inch (3.18 mm) from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

3.04 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel trusses with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

END OF SECTION

**SECTION 055000
METAL FABRICATIONS**

PART 2 PRODUCTS

END OF SECTION

**SECTION 057000
DECORATIVE METAL**

PART 2 PRODUCTS

1.01 DECORATIVE METAL UNITS

END OF SECTION

SECTION 057300 DECORATIVE METAL RAILINGS

PART 2 PRODUCTS

1.01 RAILING SYSTEMS

- A. General: Factory- or shop-fabricated to suit project conditions, for proper connection to building structure, and in largest sizes practical for delivery to site.
- B. Performance Requirements:
- C. Performance Requirements: Applying loads simultaneously not required; design and fabricate railings and anchorages to resist loads without failure, damage, or permanent set, including:
 - 1. Lateral Force: 75 lb (333 N) minimum, when tested in accordance with ASTM E935.
 - 2. Distributed Load: 50 lbf/ft (8756 N/m) minimum, applied vertically and horizontally at top of handrail, when tested in accordance with ASTM E935.
 - 3. Concentrated Loads: 200 lb (888 N) minimum, applied to handrail horizontally and vertically, in accordance with ASTM E935.
- D. Assembly: Use slip-on, nonweld mechanical fittings, flanges, escutcheons, and wall brackets to join lengths, seal open ends, and conceal exposed mounting bolts and nuts.
- E. Joints: Machined smooth with hairline seams; tightly fitted and secured.
- F. Field Connections: Provide sleeves to accommodate site assembly and installation.

END OF SECTION

SECTION 060573 WOOD TREATMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Field-applied termiticide for wood materials.
- B. Field-applied termiticide for other building materials.
- C. Field-applied mildewcide for wood materials.
- D. Field-applied preservative treatment for wood materials.
- E. Field-applied fire-retardant treatment for wood materials.

1.02 RELATED REQUIREMENTS

- A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions .
- B. Section 033000 - Cast-in-Place Concrete.
- C. Section 061000 - Rough Carpentry: Factory treatment for wood products.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide technical data for insulated sheathing, wood preservative materials, and application instructions.
- C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Site Applied Termiticide and Mildewcide: Correct defective work within a twenty-five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 FIELD-APPLIED WOOD TREATMENT

- A. Manufacturers:
 - 1. Nisus Corporation: www.nisuscorp.com/#sle.
 - 2. The Sansin Corporation: www.sansin.com/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.
- B. Field-Applied Termiticide for Wood: Borate mineral salt based, spray applied, penetrating termiticide.
 - 1. Products:
 - a. Nisus Corporation; Bora-Care: www.nisuscorp.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- C. Field-Applied Termiticide and Mildewcide: Borate mineral salt based, spray applied termiticide, mildewcide, and mold growth preventative.
 - 1. Products:
 - a. Substitutions: See Section 016000 - Product Requirements.
- D. Field-Applied Termiticide for Wood, Steel and Concrete: Borate mineral salt based, spray applied termiticide formulated for use on wood, steel, concrete and other building materials.

1. Active Ingredient: 40 percent minimum disodium octaborate tetrahydrate (DOT).
2. Carrier and Penetrant: Proprietary glycol solution.
3. Products:
 - a. Nisus Corporation; Bora-Care with Mold-Care: www.nisuscorp.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- E. Field-Applied Mold Cleaner: Nonbleaching, oxidizer based formula with high-pH tolerant surfactant. Contains no sodium hydroxide or sodium hypochlorite.
 1. Products:
 - a. Nisus Corporation; Mold Clean: www.nisuscorp.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- F. Field-Applied Wood Preservative: For treated or untreated, existing or new wood or wood-based materials.
 1. Liquid Wood Preservative: Roller, spray, or injection formula.
 - a. Preservative Action: Fungicidal, insecticidal, and moldicidal effects.
 - b. Active Ingredients: Clear solution of 19.6 percent disodium octaborate tetrahydrate with 1.0 percent didecyl dimethyl ammonium chloride.
 - c. Carrier: Proprietary mix of propylene glycol and water.
 - d. VOC: 6.51 lb/gal (780 g/L).
 2. Solid Wood Preservative: For insertion inside a hole drilled into a wood element.
 - a. Preservative Action: Fungicidal, insecticidal, and moldicidal effects.
 - b. Active Ingredients: 100 percent anhydrous disodium octaborate.
 - c. Application Format: Manufacturer's standard length and diameter solid round rod.

PART 3 EXECUTION

3.01 PREPARATION

- A. Remove dust, dirt and other contaminants from treatment surfaces. Remove tarpaulins, dropcloths, strippable protective films, etc., from areas to be treated. Move equipment and stored materials that block or prevent product application.

3.02 INSTALLATION - GENERAL

- A. Provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FIELD-APPLIED WOOD TREATMENT

- A. Comply with manufacturer's written mixing and application instructions.
- B. Termiticide: Apply to foundations, structure, and other items indicated and as follows:
 1. Structural wood and sill plates within 24 inches (610 mm), minimum, of point of contact with foundation.
 2. Wood, wood-based, and cellulosic sheathing within 24 inches (610 mm), minimum, of point of contact with foundation.
 3. Concrete foundations 2 inches (51 mm), minimum, from sill plate.
 4. Open bath traps and concrete slab within 12 inches (305 mm), minimum, of bath trap.
 5. Pipe and plumbing penetrations up to 24 inches (305 mm), minimum, above slab and slab surface and within 6 inches (152 mm), minimum, of pipe or penetration.
 6. Concrete and masonry crawl space walls up to 24 inches (610 mm), minimum, from top of soil.
 7. Concrete and masonry basement walls up to 24 inches (610 mm), minimum, from top of soil.
 8. Apply six inches (152 mm), minimum, on both sides of control joints and construction joints in slabs and joints between slabs and abutting material.
- C. Mildewcide: Apply to wood and wood-based building materials indicated.
 1. Structural wood and sill plates within 24 inches (610 mm), minimum, of point of contact with foundation.

2. Wood, wood-based, and cellulosic sheathing within 24 inches (610 mm), minimum, of point of contact with foundation.
- D. Liquid Preservative: Apply to wood and wood-based building materials indicated in accordance with manufacturer's instructions.
 1. Apply by roller, spray, or injection.
 2. Do not apply when raining or in extremely high humidity conditions.
 3. Allow preservative to dry prior to application of surface coatings.
- E. Solid Rod Preservative: Apply to wood and wood-based building materials indicated, in accordance with manufacturer's instructions.

END OF SECTION

SECTION 061000 ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural composite lumber framing.
- B. Rough opening framing for doors, windows, and roof openings.
- C. Roof-mounted curbs.
- D. Roofing nailers.
- E. Roofing cant strips.
- F. Preservative treated wood materials.
- G. Fire retardant treated wood materials.
- H. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS

- A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 033000 - Cast-in-Place Concrete: Setting anchors in concrete.
- C. Section 035400 - Cast Underlayment.
- D. Section 051200 - Structural Steel Framing: Prefabricated beams and columns for support of wood framing.
- E. Section 055000 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
- F. Section 072500 - Weather Barriers: Water-resistive barrier over sheathing.
- G. Section 072600 - Vapor Retarders: Vapor retarder over sheathing.
- H. Section 072700 - Air Barriers: Air barrier over sheathing.
- I. Section 076200 - Sheet Metal Flashing and Trim: Sill flashings.
- J. Section 077200 - Roof Accessories: Prefabricated roof curbs.
- K. Section 092116 - Gypsum Board Assemblies: Gypsum-based sheathing.
- L. Section 313116 - Termite Control: Field-applied termiticide and mildewcide for wood materials.

1.03 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- C. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process; 2022a.
- D. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- E. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
- F. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- G. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.
- H. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

- I. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).
- J. ASTM D5456 - Standard Specification for Evaluation of Structural Composite Lumber Products; 2021, with Editorial Revision.
- K. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- L. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- M. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2024.
- N. ASTM E2556/E2556M - Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment; 2010 (Reapproved 2016).
- O. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- P. AWPA U1 - Use Category System: User Specification for Treated Wood; 2025.
- Q. NELMA (SGR) - Standard Grading Rules for Northeastern Lumber; 2024.
- R. PS 20 - American Softwood Lumber Standard; 2025.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Structural Composite Lumber: Submit manufacturer's published structural data including span tables, marked to indicate which sizes and grades are being used; if structural composite lumber is being substituted for dimension lumber or timbers, submit grading agency structural tables marked for comparison.
- C. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.
- D. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.
- E. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- F. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.
- G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
 - 1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
 - 2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for materials and workmanship commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. Species: Douglas Fir-Larch, unless otherwise indicated.
 - 2. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
 - 3. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
 - 4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
- B. Lumber salvaged from deconstruction or demolition of existing buildings or structures is permitted in lieu of sustainably harvested lumber provided it is clean, denailed, and free of paint and finish materials, and other contamination; identify source.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agency: Northeastern Lumber Manufacturers Association; NELMA (SGR).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.

2.03 STRUCTURAL COMPOSITE LUMBER

- A. At Contractor's option, structural composite lumber may be substituted for concealed dimension lumber and timbers.
- B. Structural Composite Lumber Materials: Factory-fabricated engineered wood products consisting of wood veneers, strands, or flakes pressed with moisture-resistant adhesive into blocks of material, evaluated in accordance with ASTM D5456.
 - 1. Laminated Veneer Lumber (LVL): Engineered wood products consisting of thin wood veneer bonded together with adhesive with grain of veneers running parallel to long dimension.
 - a. Manufacturer's Published Modulus of Elasticity, E: 1,800,000 psi (12,410 MPa), minimum.
 - 2. Parallel Strand Lumber (PSL): Engineered wood products consisting of long wood strands bonded together with adhesive with grain running parallel to long dimension.
 - a. Strand Length-to-Thickness Ratio: Approximately 300.
 - b. Manufacturer's Published Modulus of Elasticity, E: 1,800,000 psi (12,410 MPa), minimum.
 - 3. Laminated Strand Lumber (LSL): Engineered wood products consisting of flaked wood strands bonded together with adhesive.
 - a. Strand Length-to-Thickness Ratio: Approximately 150.
 - b. Manufacturer's Published Modulus of Elasticity, E: 1,800,000 psi (12,410 MPa), minimum.
 - 4. Oriented Strand Lumber (OSL): Engineered wood product consisting of flaked wood strands bonded together with adhesive.

- a. Strand Length-to-Thickness Ratio: Approximately 75.
- b. Manufacturer's Published Modulus of Elasticity, E: 1,800,000 psi (12,410 MPa), minimum.

2.04 CONSTRUCTION PANELS

- A. Wall Sheathing: Glass mat faced gypsum with integral water-resistive and air barrier, ASTM C1177/C1177M, 5/8 inch (15.9 mm) thick.
 1. Edges: Square.
 2. Water Vapor Permeance: 1 perm (57.5 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M.
 3. Air Permeance, Sheathing: 0.001 cfm/sq ft (0.005 L/s per sq m), maximum, when tested in accordance with ASTM E2178.
 4. Air Permeance, Assembly: 0.04 cfm/sq ft (0.2 L/s per sq m), maximum, when tested in accordance with ASTM E2357.
 5. Fluid-Applied Flashing: Approved by sheathing manufacturer.
 6. Warranty:
 - a. Exposure: Manufacturer's standard; 12 months, against exposure damage, and dated from installation of product.
 - b. Defect: Manufacturer's standard; 5 years, against manufacturing defects, and dated from purchase of product.
 - c. Material: Manufacturer's standard; 5 years, dated from Date of Substantial Completion.
 - d. Effective Drainage Warranty: 12 years, dated from installation of product, when sheathing is used as substrate under approved, water-managed exterior insulation finish system (EIFS).
 7. Products:
 - a. Georgia-Pacific LLC; DensElement Barrier System: www.DensElement.com/#sle.
 - b. Tremco Commercial Sealants & Waterproofing; Securock ExoAir 430 Panel: www.tremcosealants.com/#sle.
 - c. USG Corporation; Securock ExoAir 430 Panel 5/8 in. (15.9 mm): www.usg.com/#sle.
 - d. USG Corporation; Securock ExoAir 430 Panel 1/2 in. (12.7 mm): www.usg.com/#sle.
 - e. Substitutions: See Section 016000 - Product Requirements.

2.05 ACCESSORIES

- A. Fasteners and Anchors:
 1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
 2. Gypsum Board Screws: ASTM C1002; Type W, bugle head, self-piercing, tapping screws; length to penetrate wood members 5/8 inch (15.9 mm) minimum.
 3. Anchors: Toggle bolt type for anchorage to hollow masonry.
- B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
 1. For contact with preservative treated wood in exposed locations, provide minimum G185 (Z550) galvanizing complying with ASTM A653/A653M.
- C. Sill Flashing: See Section 076200.

2.06 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWP A U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
 1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
 2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWP A standards.

B. Fire Retardant Treatment:

1. Products:
 - a. Lonza Group; ____: www.wolmanizedwood.com/#sle.
 - b. T2EARTH, LLC; OnWood: www.t2earth.com/#sle.
 - c. UFP Industries; ProWood FR Lumber: www.ufpi.com/#sle.
 - d. Viance, LLC; D-Blaze: www.treatedwood.com/#sle.
 - e. Substitutions: See Section 016000 - Product Requirements.
2. Exterior Type: AWP A U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
 - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. Treat exterior rough carpentry items.
 - c. Do not use treated wood in direct contact with the ground.
3. Interior Type A: AWP A U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
 - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. Interior rough carpentry items are to be fire retardant treated.
 - c. Treat rough carpentry items as indicated .
 - d. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:

1. Products:
 - a. Koppers Performance Chemicals, Inc; ____: www.koppersperformancechemicals.com/#sle.
 - b. Viance, LLC; Preserve ACQ: www.treatedwood.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
2. Preservative Pressure Treatment of Lumber Above Grade: AWP A U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
 - a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - b. Treat lumber in contact with roofing, flashing, or waterproofing.
 - c. Treat lumber in contact with masonry or concrete.
 - d. Treat lumber less than 18 inches (450 mm) above grade.
 - e. Treat lumber in other locations as indicated.
3. Preservative Pressure Treatment of Plywood Above Grade: AWP A U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
 - a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
 - b. Treat plywood in contact with roofing, flashing, or waterproofing.
 - c. Treat plywood in contact with masonry or concrete.
 - d. Treat plywood less than 18 inches (450 mm) above grade.
 - e. Treat plywood in other locations as indicated.
4. Preservative Pressure Treatment of Lumber in Contact with Soil: AWP A U1, Use Category UC4A, Commodity Specification A using waterborne preservative.
 - a. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.
 - b. Restrictions: Do not use lumber or plywood treated with chromated copper arsenate (CCA) in exposed exterior applications subject to leaching.

PART 3 EXECUTION

3.01 PREPARATION

- A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches (100 mm) and seal.
- B. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.
- C. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to authorities having jurisdiction may be used in lieu of solid wood blocking.
- C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- F. Provide the following specific nonstructural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Wall brackets.
 - 3. Handrails.
 - 4. Grab bars.
 - 5. Towel and bath accessories.
 - 6. Wall-mounted door stops.
 - 7. Chalkboards and marker boards.
 - 8. Wall paneling and trim.
 - 9. Joints of rigid wall coverings that occur between studs.

3.04 INSTALLATION OF CONSTRUCTION PANELS

- A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
 - 1. Place water-resistive barrier horizontally over wall sheathing, weather lapping edges and ends.
- B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches (610 mm) on center on all edges and into studs in field of board.
 - 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.

2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
 3. Install adjacent boards without gaps.
 4. Size: 48 by 96 inches (2440 by 4880 mm), installed horizontally at ceiling height.
- C. Wall Sheathing and Roof Sheathing with Laminated Water-Resistive Barrier and Air Barrier: Secure to studs in accordance with manufacturer's installation instructions.
1. Install with laminated water-resistive and air barrier on exterior side of sheathing.
 2. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
 3. Use only mechanically attached and drainable EIFS and exterior insulation with wall sheathing with laminated water-resistive and air barrier.
 4. Apply manufacturer's standard seam tape to joints between sheathing panels; use tape gun or hard rubber roller in accordance with manufacturer's installation instructions.

3.05 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

3.06 TOLERANCES

- A. Framing Members: 1/4 inch (6 mm) from true position, maximum.
- B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet (2 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

3.07 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Coordination of ABAA Tests and Inspections:
 1. Provide testing and inspection required by ABAA QAP.
 2. Notify in ABAA writing of schedule for air barrier work. Allow adequate time for testing and inspection.
 3. Cooperate with ABAA testing agency.
 4. Allow access to air barrier work areas and staging.
 5. Do not cover air barrier work until tested, inspected, and accepted.

3.08 CLEANING

- A. Waste Disposal: See Section 017419 - Construction Waste Management and Disposal.
 1. Comply with applicable regulations.
 2. Do not burn scrap on project site.
 3. Do not burn scraps that have been pressure treated.
 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 061600 SHEATHING - USG

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sheathing.
- B. Subflooring.

1.02 RELATED REQUIREMENTS

- A. Section 072500 - Weather Barriers.
- B. Section 072600 - Vapor Retarders.
- C. Section 072700 - Air Barriers.

1.03 REFERENCE STANDARDS

- A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2019.
- B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- C. ASTM C1185 - Standard Test Methods for Sampling and Testing Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards; 2023.
- D. ASTM D1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials; 2012 (Reapproved 2020).
- E. ASTM D1293 - Standard Test Methods for pH of Water; 2018.
- F. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- H. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- I. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- J. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024.
- K. ASTM E492 - Standard Test Method for Laboratory Measurement of Impact Sound Transmission through Floor-Ceiling Assemblies Using the Tapping Machine; 2022.
- L. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- M. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2024.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide technical data on sheathing, wood preservative materials, and application instructions.
- C. Certificate: Certify that products of this section meet or exceed specified requirements.
- D. Specimen warranty.

1.05 QUALITY ASSURANCE

- A. Use materials evaluated by Air Barrier Association of America (ABAA).

- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Store products above ground in dry ventilated space to protect against moisture. Support stacked products to prevent deformation and allow air circulation.
- C. Protect materials from soiling and damage.
- D. Do not stack panels over plus or minus 1/2 inch (13 mm) off pallet edge.

1.07 FIELD CONDITIONS

- A. When mechanically fastened, do not install cementitious reinforced panel when ambient or conditioned temperature is below 0 degrees F (minus 18.6 degrees C).

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide warranty for material defects and fabrication as noted in manufacturer's documentation. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. USG Corporation: www.usg.com/#sle.
- B. Substitutions: See Section 016000 - Product Requirements.

2.02 SHEATHING

- A. Structural cementitious roof sheathing panels.
 - 1. Size: 48 by 96 inches (1220 by 2440 mm), nominal.
 - 2. Thickness: 3/4 inch (19 mm), nominal.
 - 3. Edges: Square.
 - 4. Span: 48 inches (1220 mm), maximum.
 - 5. Fire Resistance: Noncombustible, when tested in accordance with ASTM E136.
 - 6. Surface Burning Characteristics: Flame spread index of 0; smoke developed index of 0; when tested in accordance with ASTM E84.
 - 7. Mold Resistance: Rating of 10, when tested in accordance with ASTM D3273.
 - 8. Density: 75 psf (3.59 kPa) in accordance with ASTM C1185.
 - 9. Weight: 5 psf (0.24 kPa) in accordance with ASTM D1037 at thickness of 3/4 inch (19 mm).
 - 10. pH Value: 10 when tested in accordance with ASTM D1293.
 - 11. Termite Resistance: 9.8 when tested in accordance with AWPA E1.
 - 12. Products:
 - a. USG Corporation; Structural Panel Concrete Roof Deck.
 - b. Substitutions: See Section 016000 - Product Requirements.
- B. Glass-mat-faced gypsum wall sheathing, comply with ASTM C1177/C1177M.
 - 1. Thickness: 1/2 inch (12.7 mm).
 - 2. Edges: Square.
 - 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 4. Products:
 - a. USG Corporation; Securock Brand UltraLight Glass-Mat Sheathing Regular.
 - b. Substitutions: See Section 016000 - Product Requirements.

- C. Glass-mat-faced gypsum wall sheathing with integral water-resistive and air barrier, comply with ASTM C1177/C1177M.
 - 1. Size: 48 by 96 inches (1220 by 2440 mm), nominal.
 - 2. Thickness: 1/2 inch (12.7 mm).
 - 3. Edges: Square.
 - 4. Water Vapor Permeance: 1 perm (57.5 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M.
 - 5. Air Permeance, Sheathing: 0.001 cfm/sq ft (0.005 L/sec/sq m), maximum, when tested in accordance with ASTM E2178.
 - 6. Air Permeance, Assembly: 0.04 cfm/sq ft (0.2 L/sec/sq m), maximum, when tested in accordance with ASTM E2357.
 - 7. Products:
 - a. USG Corporation; Securock ExoAir 430 Panel.

2.03 SUBFLOORING

- A. Structural cementitious subfloor panels.
 - 1. Size: 48 by 96 inches (1220 by 2440 mm), nominal.
 - 2. Thickness: 3/4 inch (19 mm), nominal.
 - 3. Edges: Squared along width; tongue and grooved along length.
 - 4. Span: 24 inches (610 mm), maximum.
 - 5. Fire Resistance: Noncombustible, when tested in accordance with ASTM E136.
 - 6. Surface Burning Characteristics: Flame spread index of 0; smoke developed index of 0; when tested in accordance with ASTM E84.
 - 7. Mold Resistance: Rating of 10, when tested in accordance with ASTM D3273.
 - 8. Density: 75 psf (3.59 kPa) in accordance with ASTM C1185.
 - 9. Weight: 5 psf (0.24 kPa) in accordance with ASTM D1037 at thickness of 3/4 inch (19 mm).
 - 10. pH Value: 10 when tested in accordance with ASTM D1293.
 - 11. Termite Resistance: 9.8 when tested in accordance with AWWA E1.
 - 12. Products:
 - a. USG Corporation; Structo-Crete Brand Structural Panels.

2.04 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. General: Refer to manufacturer product information for fastener types and requirements.
 - 2. Corrosion-resistant steel for 800 hours minimum in accordance with ASTM B117, unless noted otherwise on drawings.
 - 3. High Humidity and Preservative-Treated Wood Locations: Hot dip galvanized.
 - 4. Structural Panel Roof Decking and Subflooring: High corrosion resistance; epoxy-coated as recommended by manufacturer.
 - 5. Anchors: Toggle bolt type for anchorage to hollow masonry.
- B. Panel Treatment: Use manufacturer-recommended sealant, transition trips, flashing sheets, termination bars, patching materials, and adhesive tapes at control joints, panel connections, and penetrations.
- C. Sealants:
- D. Transition Membrane: Silicone extrusion for expansion joints between panels.
 - 1. USG Corporation; Proglaze ETA Connections.
- E. Air Barriers:
 - 1. Impermeable membrane with facer.
 - a. USG Corporation; ExoAir 110AT.
- F. Reinforcing Mesh: Fully embedded in air barrier for transition areas.
 - 1. USG Corporation; Securock ExoAir Reinforcing Mesh.

- G. Water-Resistive Barrier: See Section 072500.
- H. Vapor Retarder: See Section 072600.
- I. Air Barrier: See Section 072700.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify roof and floor framing meet deflection criteria noted in drawings, as recommended by manufacturer and local building code requirements.
- B. Verify floor framing complies with the following:
 - 1. Minimum Deflection: $L/360$.
 - 2. Uniform Floor Load: 330 psf (15.8 kPa).
 - 3. Framing Spacing: 24 inches (610 mm) on center.
- C. Verify roof framing complies with the following:
 - 1. Minimum Deflection: $L/360$.
 - 2. Uniform Floor Load: 150 psf (7.2 kPa).
 - 3. Framing Spacing: 48 inches (1219 mm) on center.
- D. Examine substrates and adjoining construction.
- E. Replace damaged framing before installation of cementitious panel subfloor. Proceed with installation only after unsatisfactory conditions corrected.

3.02 PREPARATION

- A. Coordinate installation of roof and floor deck construction, framing of openings, and other assembly installation.
- B. Coordinate installation of rough carpentry members specified in other sections.

3.03 INSTALLATION

- A. Select material sizes to minimize waste.
- B. Reuse and clearly separate scrap for use on-site as accessory components, including shims, bracing, and blocking.
- C. Subflooring: Screw and glue to framing according to manufacturer's requirements and installation guides; staples not permitted.
 - 1. Follow fastener pattern for design diaphragm loads as described in current Progressive Engineering, Inc evaluation report PER-13067.
 - 2. Follow panel layout in accordance with Structural Panel Concrete Subfloor application described in Progressive Engineering, Inc evaluation report PER-13067.
 - 3. Ensure panel flush with supporting member; drive fastener heads flush with surface of board.
- D. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
 - 1. At long edges, use sheathing clips where joints occur between roof framing members.
 - 2. Screw panels to framing according to manufacturer's requirements; staples not permitted.
 - 3. Follow fastener pattern for design diaphragm loads as described in current Progressive Engineering, Inc evaluation report PER-14076.
 - 4. Follow panel layout in accordance with Structural Panel Concrete Subfloor application described in Progressive Engineering, Inc evaluation report PER-14076. Lay panels with tongue-and-groove side perpendicular to flutes when installing over fluted roof deck.
 - 5. Ensure panel flush with supporting member; drive fastener heads flush with surface of board.
- E. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using screws.

1. Use plywood or other acceptable structural panels at building corners, ensure panels measure 96 inches (2440 mm) horizontally.
 2. Provide inlet diagonal bracing at corners.
- F. Wall Sheathing with Integrated Water-Resistive Barrier and Air Barrier: Secure to studs in accordance with manufacturer's installation instructions.
1. Install with water-resistive and air barrier on exterior side of sheathing.
 2. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
 3. Do not install directly over masonry surfaces; use furring strips or framing.
 4. Apply manufacturer's standard seam sealants and transition membranes.
- G. Acoustical Requirements: Where indicated on drawings, provide materials and application procedures to achieve Sound Transmission Class (STC) in accordance with ASTM E90 and Impact Insulation Class (IIC) in accordance with ASTM E492.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.

3.05 CLEANING

- A. Waste Disposal: See Section 017419 - Construction Waste Management and Disposal.
1. Comply with applicable regulations.
 2. Do not burn scrap on project site.
 3. Do not burn pressure treated scraps.
- B. Clean material debris, shavings, and sawdust prior to Substantial Completion of project.

END OF SECTION

SECTION 062000 FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Finish carpentry items.
- B. Wood door frames, glazed frames.
- C. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS

- A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 061000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- C. Section 064100 - Architectural Wood Casework: Shop fabricated custom cabinet work.
- D. Section 081416 - Flush Wood Doors.
- E. Section 099113 - Exterior Painting: Painting of finish carpentry items.
- F. Section 099123 - Interior Painting: Painting of finish carpentry items.
- G. Section 099300 - Staining and Transparent Finishing: Staining and transparent finishing of finish carpentry items.

1.03 REFERENCE STANDARDS

- A. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- D. AWI (QCP) - Quality Certification Program; Current Edition.
- E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- F. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- G. BHMA A156.9 - Cabinet Hardware; 2020.
- H. GSA CID A-A-1936 - Adhesives, Contact, Neoprene Rubber; 1996a (Validated 2013).
- I. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.
- J. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- K. PS 1 - Structural Plywood; 2023.
- L. WDMA I.S. 4 - Industry Specification for Preservative Treatment for Millwork; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Manufacturer's Instructions: Provide manufacturer's installation instructions for factory-fabricated units.

1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- B. Quality Certification:
 1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
 2. Provide labels or certificates indicating that work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
 3. Provide designated labels on shop drawings as required by certification program.
 4. Provide designated labels on installed products as required by certification program.
 5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.
- B. Protect from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.
- C. Interior Woodwork Items:
 1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.

2.02 LUMBER MATERIALS

- A. Softwood Lumber: sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
- B. Hardwood Lumber: sawn, maximum moisture content of 6 percent ; with vertical grain , of quality suitable for transparent finish.

2.03 SHEET MATERIALS

- A. Softwood Plywood, Not Exposed to View: Any face species, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.
- B. Softwood Plywood, Exposed to View: Face species as indicated, plain sawn, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.
- C. Hardwood Plywood: Face species as indicated, plain sawn, book matched, medium density fiberboard core; HPVA HP-1 Front Face Grade AA, Back Face Grade 1, glue type as recommended for application.

2.04 PLASTIC LAMINATE MATERIALS

- A. Plastic Laminate: NEMA LD 3; color as selected by Architect; textured, low gloss finish.
- B. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

2.05 FASTENINGS

- A. Adhesive for factory-fabricated units: Manufacturer's recommended adhesive for application.
- B. Fasteners for Exterior Applications: Stainless steel; length required to penetrate wood substrate 1-1/2 inch (38 mm) minimum.
- C. Concealed Joint Fasteners: Threaded steel.

- D. Metal Z-Shaped Support Clips: Paired, cleated, structural anchorage components applied to back of finish carpentry items and walls for mounting.
 - 1. Material: Extruded aluminum.
 - 2. Thickness: 0.115 inch (2.92 mm).
 - 3. Height: 1.25 inches (31.8 mm).
 - 4. Stand-Off: 0.240 inch (6.10 mm).
 - 5. Lift-Off: 0.375 inch (9.53 mm).
 - 6. Width: 72 inches (1830 mm).
 - 7. Products:
 - a. Eagle Aluminum; Eagle Z-Clips: www.eagle-aluminum.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.06 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Plastic Edge Trim: Extruded convex shaped; smooth finish; self locking serrated tongue; of width to match component thickness; _____ color.
- C. Aluminum Trim and Mouldings: Extruded, alloy 6063 T5.
 - 1. Type: Profile as selected from manufacturer's standard range.
 - 2. Flange: 0.188 inch (4.7752 mm).
 - 3. Depth: 3/4 inch (19.05 mm).
 - 4. Finish: Clear anodized.
 - 5. Products:
 - a. Eagle Aluminum; Architectural Woodwork Trim: www.eagle-aluminum.com/#sle.
 - b. Flannery, Inc; Metal Edge Trim: www.flannerytrim.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
- D. Aluminum Edge Trim: Extruded convex shape; smooth surface finish; self locking serrated tongue; of width to match component thickness; natural mill finish.
- E. Safety Glass: ASTM C1048, fully tempered; clear; 1/8 inch (3 mm) thick, minimum.
- F. Wood Filler: Solvent base, tinted to match surface finish color.

2.07 HARDWARE

- A. Hardware: Comply with BHMA A156.9.
- B. Countertop Support Brackets: Fixed, L-shaped, corner reinforced, face-of-stud mounting.
 - 1. Material: Steel.
 - a. Finish: Manufacturer's standard, factory-applied, textured powder coat.
 - b. Height: 5 inches (130 mm).
 - c. Support Length: 8 inches (200 mm).
 - 2. Products:
 - a. A&M Hardware, Inc; Standard Brackets: www.aandmhardware.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- C. Vanity Brackets: Fixed, ADA-Compliant, face-of-stud mounting.
 - 1. Material: Steel; formed compound shapes.
 - a. Finish: Manufacturer's standard, factory-applied, textured powder coat.
 - b. Color: Black.
 - 2. Products:
 - a. A&M Hardware, Inc; ADA Vanity Brackets: www.aandmhardware.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.08 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Cap exposed plastic laminate finish edges with aluminum trim.

- C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs. (Locate counter butt joints minimum 600 mm from sink cut-outs.)

2.09 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent:
 - a. System - 1, Lacquer, Nitrocellulose.
 - b. Sheen: Flat.
 - 2. Opaque:
 - a. System - 1, Lacquer, Nitrocellulose.
 - b. Color: As selected by Architect.
 - c. Sheen: Flat.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

- A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure materials and components in place, plumb and level.
- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim to conceal larger gaps.

3.03 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch (1.6 mm).
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.79 mm).

END OF SECTION

SECTION 064100 ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hardware.
- B. Factory finishing.

1.02 RELATED REQUIREMENTS

- A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 061000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- C. Section 088000 - Glazing: Glass for casework.
- D. Section 099123 - Interior Painting: Field finishing of cabinet exterior.
- E. Section 099300 - Staining and Transparent Finishing: Field finishing of cabinet exterior.
- F. Section 123600 - Countertops.

1.03 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2022.
- B. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.
- C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- E. BHMA A156.9 - Cabinet Hardware; 2020.
- F. ISO 4586-2 - High-Pressure Decorative Laminates (HPL, HPDL) – Sheets Based on Thermosetting Resins (Usually Called Laminates) – Part 2: Determination of Properties; 2018.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 - 1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- B. Quality Certification:
 - 1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
 - 2. Provide designated labels on shop drawings as required by certification program.
 - 3. Provide designated labels on installed products as required by certification program.
 - 4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
 - 5. Replace, repair, or rework all work for which certification is refused.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. EGGER: www.egger.com/#sle.
- B. Substitutions: See Section 016000 - Product Requirements.

2.02 CABINETS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.03 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.
- B. Provide sustainably harvested wood, certified or labeled; see Section 016000.
- C. Provide wood harvested within a 500 mile (805 km) radius of the project site.
- D. Wood fabricated from timber recovered from riverbeds or otherwise abandoned is permitted, unless otherwise noted, provided it is clean and free of contamination; identify source; provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc.

2.04 PANEL CORE MATERIALS

- A. Particleboard: Composite panel composed of cellulosic particles, additives, and bonding system; comply with ANSI A208.1.
 - 1. Grade: M-2; moisture resistance: MR10.
 - 2. Panel Thickness: 1/2 inch (12.7 mm).
 - 3. Products:
 - a. EGGER; Eurospan Raw PB TSCA 187: www.egger.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- B. Medium Density Fiberboard (MDF): Composite panel composed of cellulosic fibers, additives, and bonding system; cured under heat and pressure; comply with ANSI A208.2.
 - 1. Grade: 115; moisture resistance: MR10.
 - 2. Panel Thickness: 1 inch (25.4 mm).
 - 3. Products:
 - a. Roseburg Forest Products; ____: www.roseburg.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.05 HARDWOOD PLYWOOD PANELS

2.06 THERMALLY FUSED LAMINATE PANELS

- A. Thermally Fused Laminate (TFL): Melamine- or polyester-resin-saturated decorative papers; for fusion to composite wood substrates under heat and pressure.
 - 1. Panel Core Substrate: Particleboard.
 - 2. Color: White.
 - 3. Products:
 - a. EGGER; Eurodekor TFL PB TSCA 187: www.egger.com/#sle.
 - b. Wilsonart LLC; Thermally Fused Laminate Panels: www.wilsonart.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.

2.07 LAMINATE MATERIALS

- A. Manufacturers:
 - 1. Arborite; ColorEdge: www.arborite.com/#sle.
 - 2. EGGER: www.egger.com/#sle.
 - 3. Formica Corporation; ____: www.formica.com/#sle.
 - 4. Wilsonart LLC; ____: www.wilsonart.com/#sle.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- B. High Pressure Decorative Laminate (HGP): ISO 4586-2, types as recommended for specific applications.

2.08 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
 - 1. Manufacturers:

- a. Franklin International, Inc; Titebond Original Wood Glue: www.titebond.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- B. Plastic Edge Banding: Extruded ABS or PVC, convex shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
 - 1. Color: As selected by Architect from manufacturer's standard range.
 - 2. Color: As indicated on drawings.
 - 3. Use at all exposed plywood edges.
 - 4. Use at all exposed shelf edges.
 - 5. Products:
 - a. EGGER; _____: www.egger.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- C. Aluminum Edge Banding: Extruded convex shape; smooth surface finish; self locking serrated tongue; of width to match component thickness; natural mill finish.
- D. Aluminum Trim and Mouldings: Extruded, alloy 6063 T5.
 - 1. Type: Profile as selected from manufacturer's standard range.
 - 2. Flange: 0.188 inch (4.7752 mm).
 - 3. Depth: 3/4 inch (19.05 mm).
 - 4. Products:
 - a. Eagle Aluminum; Architectural Woodwork Trim: www.eagle-aluminum.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- E. Vinyl Countertop Edge: PVC anchor type tee-molding edging in width to match thickness of countertop, color as indicated, used at locations as indicated.
- F. Glass: Type A, see Section 088000.
- G. Fasteners: Size and type to suit application.
- H. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- I. Concealed Joint Fasteners: Threaded steel.
- J. Adjustable Drawer Organization Systems: Drawer trays, dividers, and connectors.
 - 1. Products:
 - a. Blum, Inc; AMBIA-LINE; www.blum.com/#sle.
 - b. Blum, Inc; ORGA-LINE; www.blum.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
- K. Grommets: Standard plastic, painted metal, or rubber grommets for cut-outs, in color to match adjacent surface.

2.09 HARDWARE

- A. Cabinet Hardware: Comply with BHMA A156.9 for hardware types and grades indicated below:
 - 1. Hardware Types: As indicated on drawings.
 - 2. Product Grade: Grade 2.
- B. Metal Z-Shaped Wall Cabinet Support Clips: Paired, cleated, structural anchorage components applied to back of cabinets and walls for wall cabinet mounting.
 - 1. Material: Extruded Aluminum.
 - 2. Products:
 - a. Eagle Aluminum; Eagle Z-Clips: www.eagle-aluminum.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- C. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.
- D. Shelf Support Brackets: Fixed, L-shaped, corner reinforced, face-of-stud mounting.

1. Materials: Formed steel shapes.
 - a. Finish: Manufacturer's standard, factory-applied, textured powder coat.
2. Height: 5 inches (130 mm).
3. Support Length: 8 inches (200 mm).
4. Products:
 - a. A&M Hardware, Inc; Standard Brackets: www.aandmhardware.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- E. Soft-Close, Door and Drawer Adjustable Dampers:
 1. Manufacturers:
 - a. Titus Cabinet Hardware; Slidix: www.titusplus.com/us/en/#sle.
 - b. Titus Cabinet Hardware; Titusoft Dampers for Drawers: www.titusplus.com/us/en/#sle.
- F. Hinges: European style concealed self-closing type, steel with nickel-plated finish.
 1. Manufacturers:
 - a. Blum, Inc; CLIP top BLUMOTION: www.blum.com/#sle.
 - b. Blum, Inc; COMPACT BLUMOTION: www.blum.com/#sle.
 - c. Blum, Inc; COMPACT CLIP 30C2: www.blum.com/#sle.
 - d. Blum, Inc; COMPACT CLIP 31C1: www.blum.com/#sle.
 - e. Blum, Inc; COMPACT CLIP 31C3: www.blum.com/#sle.
 - f. Substitutions: See Section 016000 - Product Requirements.
- G. Mechanical Automatic Opening System: Concealed; steel with polished finish.
 1. Manufacturers:
 - a. Grass America Inc; ____: www.grassusa.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- H. Sliding Door Track Assemblies: Upper and lower track of satin anodized aluminum, with matching shoe equipped with nylon rollers.
- I. Cabinet Pocket Door Slides:
 1. Class: Medium-duty.
 2. Bracket: Surface-mounted.
 3. Slide: Manufacturer's standard steel ball-bearings.
 4. Finish: Manufacturers standard, factory-applied black coating.
 5. Manufacturers:
 - a. Accuride International, Inc; Light-Duty Pocket Door Slides: www accuride.com/#sle.
 - b. Knappe & Vogt Manufacturing Company; 8070 Series Pocket Door Slides: www.knappeandvogt.com/#sle.
 - c. Knappe & Vogt Manufacturing Company; 8080 Series Pocket Door Slides: www.knappeandvogt.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- J. Pocket Door Hardware System:
 1. Description: Hardware kit; facilitates doors to slide into dedicated door pockets; includes swinging door hinges, two-leaf folding door hinges, and overhead tracks.
 2. Door Opening Width: As indicated on drawings.
 3. Door Opening Height: As indicated on drawings.
 4. Pocket Opening Width: As indicated on drawings.
 5. Door Opening Configuration: As indicated on drawings.
 6. Hardware Material and Finish:
 7. Products:
 - a. Blum, Inc; REVEGO; www.blum.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.10 SITE FINISHING MATERIALS

- A. Stain, Shellac, Varnish, and Finishing Materials: In compliance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.11 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs. (Locate counter butt joints minimum 600 mm from sink cut-outs.)
 - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
 - 2. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- E. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:
 - 1. Provide center matched panels at each elevation.
 - 2. Provide sequence matching across each elevation.
- F. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches (400 mm) on center.
- G. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.
- H. Shop glaze glass materials using Interior Dry method; see Section 088000.

2.12 SHOP FINISHING

- A. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.
- B. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.
- C. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent:
 - a. System - 1, Lacquer, Nitrocellulose.
 - b. Sheen: Flat.
 - 2. Opaque:
 - a. System - 1, Lacquer, Nitrocellulose.
 - b. Color: As selected by Architect.
 - c. Sheen: Flat.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

3.03 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 070150.19 PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Replacement of existing roofing system in preparation for entire new roofing system.
- B. Partial replacement of existing roofing system in preparation for replacement roofing system in designated areas as indicated on drawings.
- C. Re-cover of existing roofing system in preparation for entire new roofing system.
- D. Removal of existing flashing and counterflashings.
- E. Temporary roofing protection.

1.02 RELATED REQUIREMENTS

- A. Section 075100 - Built-Up Bituminous Roofing.
- B. Section 076200 - Sheet Metal Flashing and Trim: Replacement of flashing and counterflashings.

1.03 REFERENCE STANDARDS

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with affected mechanical and electrical work associated with roof penetrations.
- B. Schedule work to coincide with commencement of installation of new roofing system.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit for each type of material.
- C. Shop Drawings: Indicate size, configuration, and installation details.
- D. Preconstruction Test Reports.
- E. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

- A. Materials Removal Company Qualifications: Company specializing in performing work of type specified with at least three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

1.08 FIELD CONDITIONS

- A. Do not remove existing roofing membrane when weather conditions threaten the integrity of building contents or intended continued occupancy.
- B. Maintain continuous temporary protection prior to and during installation of new roofing system.
- C. Provide notice at least three days before starting activities that will affect normal building operations.
- D. Owner will occupy building areas directly below re-roofing area.
 - 1. Provide Owner with at least 48 hours written notice of roofing activities that may affect their operations and to allow them to prepare for upcoming activities as necessary.
 - 2. Do not disrupt Owner's operations or activities.

3. Maintain access of Owner's personnel to corridors, existing walkways, and adjacent buildings.

1.09 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 COMPONENTS

- A. See the following sections for additional information on components relating to this work:
 1. Replacement and removal of existing roofing system in preparation for entire new roofing system, see Section 075100.
 2. Remove existing flashing and counterflashings in preparation for replacement of these materials as part of this work, see Section 076200 for material requirements.

2.02 MATERIALS

- A. Patching Materials: Provide necessary materials in accordance with requirements of existing roofing system.
- B. Temporary Roofing Protection Materials:
 1. Contractor's responsibility to select appropriate materials for temporary protection of roofing areas as determined necessary for this work.
- C. Roofing Recover Materials:
 1. Contractor's responsibility to select appropriate materials for roofing re-cover as determined necessary for this work.

2.03 ACCESSORIES

- A. Fasteners: Type and size as required and compatible with existing and new roofing system to resist local wind uplift.
- B. Roof Vent Pipe Extension: Solid-wall PVC fitting consisting of pipe and splice sleeve inserts, configured for insertion and sealing to existing plumbing vent piping, sized to fit inside diameter of plumbing vent piping, enabling extension of piping to field-determined height to meet local building code requirements for plumbing vent pipe height above existing roof level.
 1. Manufacturers:
 - a. Tubos Inc; Tubos Vent Extensions: www.tubos.biz/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 PREPARATION

- A. Sweep roof surface clean of loose matter.
- B. Remove loose refuse and dispose of properly off-site.

3.03 MATERIAL REMOVAL

- A. Remove metal counter flashings.
- B. Remove damaged insulation and fasteners, cant strips, and blocking.
- C. Remove vapor retarder, sheathing paper, underlay, and _____.

3.04 INSTALLATION

- A. Coordinate scope of this work with requirements for installation of new roofing system, see Section 075100 for additional requirements.

3.05 PROTECTION

- A. Provide protection of existing roofing system that is not having work performed on it.
- B. Provide temporary protective sheeting over uncovered deck surfaces.

- C. Provide for surface drainage from sheeting to existing drainage facilities.
- D. Do not permit traffic over unprotected or repaired deck surface.
- E. Install recover board over existing membrane.

END OF SECTION

SECTION 070543 CLADDING SUPPORT SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cladding support systems, directly attached to substrates.
- B. Cladding support systems, insulation penetrating.
- C. Cladding support systems, dual systems.

1.02 RELATED REQUIREMENTS

- A. Section 054000 - Cold-Formed Metal Framing.
- B. Section 061000 - Rough Carpentry.
- C. Section 072100 - Thermal Insulation.
- D. Section 072500 - Weather Barriers.
- E. Section 072600 - Vapor Retarders.
- F. Section 072700 - Air Barriers.
- G. Section 074213 - Metal Wall Panels.

1.03 ABBREVIATIONS AND ACRONYMS

- A. Zn-Al-Mg: Zinc-aluminum-magnesium.

1.04 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2025a.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- E. ASTM A1046/A1046M - Standard Specification for Steel Sheet, Zinc-Aluminum-Magnesium Alloy-Coated by the Hot-Dip Process; 2022.
- F. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2023.
- G. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- H. ASTM C1363 - Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus; 2019.
- I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- J. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.
- K. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate cladding support system manufacturer's requirements with requirements of exterior structural wall assemblies.

1.06 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's published descriptive data, including product attributes.
 - 1. Include data for cladding support system.
- C. Shop Drawings: For each cladding support system; indicate:
 - 1. Sections: Include column centers, elevations, and dimensions; indicate locations of system components, component spacings, and wall fasteners.
 - a. Drawing Scale: 1/8 inch to 1 foot (1:100), minimum.
 - 2. Details: Connection details between cladding support systems and substrates; indicate fastener size and spacing.
 - a. Drawing Scale: 1-1/2 inches to 1 foot (1:10), minimum.
- D. Certificate: Certify cladding support systems of this section meet or exceed specified design criteria.
- E. Delegated Design Documents: Submit for information, signed and sealed documents by structural engineer of record responsible for comprehensive design package of cladding system, including wall fasteners and anchors. Submit structural design, rail spacing, and calculations sufficient to comply with structural design criteria of this section.
- F. Design Data: Submit for information, project-specific thermal performance values for above-grade walls; prepared by professional engineer; substantiate values based on alternative compliance methods described in ASHRAE Std 90.1 I-P and acceptable by AHJ.
 - 1. Submit comprehensive, three-dimensional, thermal modeling report indicating framing system's impact on continuous insulation U-factors.
- G. Manufacturer's Instructions: Submit manufacturer's written installation instructions.
- H. Designer's qualification statement.

1.07 QUALITY ASSURANCE

- A. Designer Qualifications for Contractor's Design-Related Professional Design Services: Qualified professional structural engineer experienced in design of cladding support systems and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience and approved by manufacturer.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Deliver products to project site in wrapped, protected, unbroken packaging with product identification labeling.
- C. Store products under cover and elevated above grade.
- D. Handle products without damaging; prevent bending, warping, and twisting to surfaces, edges, or corners.

1.09 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Installer Warranty: Provide 2-year warranty against installation defects commencing on Date of Substantial Completion. Complete forms in Owner's name and register with installer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hohmann & Barnard, Inc; HB RS EZclad Rainscreen Support System: www.h-b.com/#sle.

- B. Northern Facades: www.northernfacades.com/#sle.
- C. Substitutions: See Section 016000 - Product Requirements.
- D. Source Limitations: Provide complete cladding support system including wall fasteners and wall anchors from single manufacturer.

2.02 PERFORMANCE CRITERIA

- A. Surface Burning Characteristics: Provide cladding support systems with a flame spread index (FSI) of 25 or less, and a smoke developed index (SDI) of 450 or less, when tested in accordance with ASTM E84 or UL 723.
- B. Fire Propagation Requirements of Exterior Wall Assemblies: Tested in accordance with, and comply with, the acceptance criteria of NFPA 285.

2.03 DESIGN CRITERIA

- A. See Section 014000 - Quality Requirements for additional information.
- B. Structural Design Services: Provide Contractor's design-related professional services for structural design of cladding support systems based on the following criteria:
 - 1. Design Loads: Exterior wall design loads as indicated on structural drawings.
 - 2. Fastener Design Criteria: As indicated on drawings.
 - 3. Thermal Movement Design Criteria: Cladding systems allow for thermal movements without overstressing components and evidence of permanent component defects, based on maximum ambient temperature of 120 degrees F (49 degrees C).
- C. Thermal Performance Design Services: Provide Contractor's design-related professional services for thermal performance design of cladding support systems:
 - 1. Design Criteria: Provide cladding support systems that, when combined with thermal performance of continuous insulation and other exterior wall assembly components, provide building envelope wall assemblies that meet minimum energy efficiency requirements of ASHRAE Std 90.1 I-P.
 - 2. For assembly U-factors determined by testing, provide design based on values in accordance with ASTM C1363.
 - 3. Assembly Maximum U-Factor for Walls Above Grade, Opaque Elements: _____.

2.04 EXTERIOR WALL ASSEMBLIES WITH CLADDING SUPPORT SYSTEMS

- A. Cladding: See Section 074213.
- B. Depth of Air-Gap Cavity: As indicated on drawings.
- C. Cladding Support System Applications:
 - 1. Direct-attached-to-substrate cladding support systems.
 - 2. Insulation-penetrating cladding support systems.
 - 3. Dual-system cladding support systems.
- D. Water-Resistive Barriers: See Section 072500.
- E. Vapor Retarders: See Section 072600.
- F. Air Barriers: See Section 072700.
- G. Sheathing: See Section 061000.

2.05 CLADDING SUPPORT SYSTEMS, DIRECTLY ATTACHED TO SUBSTRATE

- A. Perforated Metal, Hat-Shaped, Cladding Attachment Rails:
 - 1. Description: Square-shaped hat channels perforated with vent holes; hat-shape faces outward; flanges with stiffening lips and fastener attachment holes.
 - 2. Attachments to Substrate: Manufacturers recommended anchors fasten rails to substrates through attachment holes of flanges.
 - 3. Applications:
 - 4. Material: Zn-Al-Mg coated steel sheet in accordance with ASTM A1046/A1046M.
 - 5. Material: Stainless steel sheet.

6. Depth: 3/4 inch (19 mm).
7. Thickness: 18 gauge, 0.048 inch (1.2 mm).
8. Flange Width: Two equal flanges, each 1 inch (25 mm) wide, nominal.
9. Face Width and Total Width Including Flanges:
 - a. Face Width: In accordance with Contractor-provided structural design.
10. Orientation in Direct-Attached-to-Substrate Applications: As indicated on drawings.
11. Spacing: In accordance with Contractor-provided structural design.
12. Products:
 - a. Knight Wall Systems; PanelRail: www.knightwallsystems.com/#sle.
 - b. _____.
 - c. Substitutions: See Section 016000 - Product Requirements.

2.06 CLADDING SUPPORT SYSTEMS, INSULATION PENETRATING

- A. Z-Shaped, Thermally Improved Systems:
 1. Description: Z-shaped, thermally improved, perforated steel rails with hollow-core, extruded plastic, thermal isolation strips along back of rails; rails penetrate continuous insulation.
 2. Attachments to Substrate: Manufacturers recommend wall fasteners attach rails to steel-framed exterior wall assemblies through attachment holes of inboard face of Z-shaped rails.
 3. Applications:
 - a. Insulation-penetrating cladding support systems.
 4. Material: Zn-Al-Mg coated steel sheet in accordance with ASTM A1046/A1046M.
 5. Material: Stainless steel sheet.
 6. Depth: As indicated on drawings.
 7. Thickness: 18 gauge, 0.048 inch (1.2 mm).
 8. Outward Face Width: _____ inches (_____ mm).
 9. Orientation: As indicated on drawings.
 10. Rail Spacing: In accordance with Contractor-provided structural design.
 11. Products:
 - a. Knight Wall Systems; ThermaZee: www.knightwallsystems.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.07 CLADDING SUPPORT SYSTEMS, DUAL SYSTEMS

- A. Description: Cladding support systems composed of primary and secondary systems; secondary system attached to and outboard of primary system.
- B. Locations: Where indicated on drawings.
- C. Inboard Primary Systems:
 1. Description: Thermally improved, insulation-penetrating, bracket-and-rail system; attached to steel-framed wall assemblies; supports secondary cladding support system.
 2. Wall Brackets: Preassembled assemblies composed of thermal-isolating polyoxymethylene base plates, formed steel brackets, and stem isolators.
 - a. Bracket Assembly Dimensions:
 - 1) Base Width: 2-1/8 inches (53.98 mm), minimum.
 - 2) Base Height: 3-1/8 inches (79.38 mm), minimum.
 - 3) Steel Bracket Thickness: 14-gauge, 0.074-inch (1.9 mm) sheet steel.
 - 4) Assembly Depth Including Static Rail: 5-3/4 inches (146 mm), nominal.
 - 5) Assembly Depth Including Dynamic Rail: 5-1/2 inches (140 mm), nominal.
 - b. Steel Bracket Material: Aluminum-zinc-alloy coated steel sheet.
 - c. Bracket Spacing: In accordance with contractor-provided structural design.
 - d. Rail Orientation: As indicated on drawings.
 - e. Rail Spacing: In accordance with contractor-provided structural design.
 - f. Rail-to-Bracket Connection: Fixed.

3. Metal Rails:
 - a. Description: Z-shaped, thermally improved, perforated steel rails with hollow-core, extruded plastic thermal isolation strips along back of rails.
 - b. Material: Aluminum-zinc-alloy coated steel sheet.
 - c. Thickness: 18 gauge, 0.046 inch (1.17 mm), minimum.
4. Depth: As indicated on drawings.
5. Thickness: 18 gauge, 0.048 inch (1.2 mm).
6. Rail Orientation: As indicated on drawings.
7. Outward Face Width: In accordance with Contractor-provided structural design.
8. Spacing: In accordance with Contractor-provided structural design.
9. Products:
 - a. Substitutions: See Section 016000 - Product Requirements.
- D. Outboard Secondary Rail Systems:
 1. Description: Attached to and outboard of primary rail support systems.
 2. Material: Zn-Al-Mg coated steel sheet in accordance with ASTM A1046/A1046M.
 3. Material: Stainless steel sheet.
 4. Depth: 3/4 inch (19 mm).
 5. Thickness: In accordance with Contractor-provided structural design.
 6. Orientation: As indicated on drawings.
 7. Outward Face Width: In accordance with Contractor-provided structural design.
 8. Spacing: In accordance with Contractor-provided structural design.
 9. Products:
 - a. Substitutions: See Section 016000 - Product Requirements.

2.08 MATERIALS

- A. Zinc-Aluminum-Magnesium (Zn-Al-Mg)-Coated Steel Sheet:
 1. ASTM A1046/A1046M, Designation SS, Grade 50, Class 2; Coating Designation ZM40.
 2. Thickness: 18 gauge, 0.048 inch (1.2 mm).
 3. Finish: Superior performing organic coatings complying with AAMA 2605, multiple coats, thermally cured polyvinylidene fluoride system; finish one side only.
- B. Stainless Steel Sheet:
 1. Thickness: Manufacturer's recommended thickness for application.
 2. ASTM A240/A240M; Type 304.
- C. Aluminum-Zinc-Alloy Coated Steel Sheet: ASTM A792/A792M, AZ50 (AZM150) coating designation.
- D. Sheet Aluminum: ASTM B209/B209M, 6063 alloy, T6 temper.
 1. Mill finish.

2.09 FABRICATION

- A. Shop fabricate to greatest extent possible.

2.10 ACCESSORIES

- A. Miscellaneous Nonstructural Accessories: Provide nonstructural accessories; flashings, sealants, tapes, and shims as recommended by manufacturer, suitable for project-specific applications, and compatible with system components.
- B. Miscellaneous Structural Metal Accessories: For metal accessories under superimposed structural loads, provide corrosion-resistant-coated steel bracing, furring, and clips in accordance with Contractor-provided structural design of cladding system.
- C. Metal Accessories: Provide transition units as recommended by manufacturer, suitable for project-specific applications, and compatible with system components.

- D. Miscellaneous Thermal Isolation Accessories: Manufacturer's thermoplastic shims that do not decrease thermal or structural system performance, thickness, shape, and structural compressive strength suitable for project-specific applications.
- E. Fasteners Between Claddings and Cladding Support Systems:
 - 1. In accordance with Contractor-provided structural design of cladding system.
- F. Wall Anchors:
 - 1. Manufacturer's corrosion-resistant-coated steel wall anchors with recommended washers for anchoring cladding support systems to concrete structural wall assemblies.
 - a. Structural Performance: Manufacturer's wall anchors; type, spacing, and embedment in accordance with Contractor-provided structural design of cladding system.
 - b. Thermal Performance: Manufacturer's wall anchors with thermally isolated polymer washers.
- G. Wall Fasteners:
 - 1. Wall fasteners as indicated on drawings.
- H. Thermal Isolation Clips: Thermally broken clips providing attachment support for girts, angles, channels, and other cladding support framing.
 - 1. Thermal Spacer Clip: Polyamide resin.
 - 2. Galvanized Steel Support Clip: 14 gauge, 0.0747 inch (1.9 mm), G90 (Z275) galvanized support clip complying with ASTM A653/A653M, with integral glass-fiber-reinforced polyamide thermal isolator pad.
 - 3. Stainless Steel Support Clip: 16 gauge, 0.0625 inch (1.59 mm), type 304 stainless steel with thermal isolator pad.
 - 4. Clip Depth: As required for thickness of insulation.
 - 5. Clip Spacing: 16 inches (406 mm) on center, vertically.
 - 6. Fasteners: As recommended by clip manufacturer.
 - 7. Products:
 - a. Carter Architectural Panels, Inc; KOA Thermal Clip: www.carterpanels.com/#sle.
 - b. Northern Facades; ISO Clip: www.northernfacades.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions:
 - 1. Verify substrates comply with contract documents, including specified tolerances, and are ready to receive work of this section.
 - 2. Verify air barrier, wall flashing, and rigid insulation work comply with contract documents.
- B. Do not commence installation until noncompliant conditions have been corrected.

3.02 PREPARATION

- A. Protection of In-Place Conditions: Protect air barrier work from damage.
- B. Surface Preparation:
 - 1. Prepare substrate surfaces using methods in accordance with cladding support system manufacturer's written instructions.
 - 2. Clean substrate surfaces before commencement of cladding support systems.

3.03 INSTALLATION

- A. Installation of Cladding Support System Substrates.
- B. Installation of cladding systems:
 - 1. See Section 074213 for installation of metal wall panels.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.

3.05 CLEANING

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

3.06 PROTECTION

- A. Protect installed cladding support systems from subsequent construction operations.

END OF SECTION

SECTION 070553 FIRE AND SMOKE ASSEMBLY IDENTIFICATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Identification markings for fire and smoke rated partitions, and fire rated walls.

1.02 RELATED REQUIREMENTS

- A. Section 099123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of marking, indicating font, foreground and background colors, wording, and overall dimensions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Partition Identification Labels:
 - 1. Fire Wall Signs, Inc; _____: www.firewallsigns.com/#sle.
 - 2. Safety Supply Warehouse, Inc; _____: www.safetysupplywarehouse.com/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.

2.02 FIRE AND SMOKE ASSEMBLY IDENTIFICATION

- A. Regulatory Requirements: Comply with "Marking and Identification" requirements of "Fire-Resistance Ratings and Fire Tests" chapter of ICC (IBC).
- B. Adhered Fire and Smoke Assembly Identification Signs: Printed vinyl or paper sign with factory applied adhesive backing.
- C. Applied Fire and Smoke Assembly Identification: Identification markings applied to partition with paint and a code compliant stencil. See Section 099123 for products.
- D. Languages: Provide sign markings in English.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.02 PREPARATION

- A. See Section 099123 for substrate preparation for painted markings.

3.03 INSTALLATION

- A. Locate markings as required by ICC (IBC).
- B. Install adhered markings in accordance with manufacturer's instructions.
- C. Install applied markings in accordance with Section 099123.
- D. Install neatly, with horizontal edges level.
- E. Protect from damage until Date of Substantial Completion; repair or replace damaged markings.

END OF SECTION

SECTION 072100 THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Board insulation and integral vapor retarder at cavity wall construction, perimeter foundation wall, underside of floor slabs, over roof deck, over roof sheathing, and interior wall with facer providing exposed finish.
- B. Batt insulation and vapor retarder in exterior wall, ceiling, and roof construction.
- C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.
- D. Insulating coating.

1.02 RELATED REQUIREMENTS

- A. Section 061000 - Rough Carpentry: Installation requirements for board insulation over steep slope roof sheathing or roof structure.
- B. Section 072600 - Vapor Retarders: Separate vapor retarder materials.
- C. Section 072700 - Air Barriers: Separate air barrier materials.

1.03 DEFINITIONS

- A. Mineral Fiber Material Composition: Insulation referred to as mineral fiber block, board, and blanket insulation is composed of fibers from mineral based substances such as rock, slag, or glass and processed from the molten state into fibrous form.
 - 1. Based on type of insulation substance, the material will be referred to as a mineral fiber when having a rock or slag base, and glass fiber with a glass or silica sand base, also considered a mineral.
 - 2. Insulation blankets are flexible units consisting of felted, bonded, or unbonded fibers formed into rolls or flat cut pieces referred to as batts; rolls are simply longer versions of batts.
 - 3. For additional information about mineral fiber and the various classification types, refer to the following reference standards; ASTM C553, ASTM C612, ASTM C665, and ASTM C726.

1.04 REFERENCE STANDARDS

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013 (Reapproved 2019).
- C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).
- E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.
- F. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2017.
- G. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.
- H. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).
- I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

- J. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024.
- K. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Shop Drawings: Submit drawings that indicate location of joint or termination detail conditions.
- D. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.
- E. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- F. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of contractor accreditation and installer certification on project site during and after installation. Present on-site documentation upon request.

1.06 QUALITY ASSURANCE

- A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
 - 1. Installer Qualification: Use accredited contractors, certified installers, evaluated materials, and third-party field quality control audit.
 - 2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

PART 2 PRODUCTS

2.01 APPLICATIONS

- A. Insulation in Wood Framed Walls: Batt insulation with separate vapor retarder.

2.02 FOAM BOARD INSULATION MATERIALS

- A. Expanded Polystyrene (EPS) Board Insulation: Comply with ASTM C578.
 - 1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
 - 2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
 - 3. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
 - 4. Board Size: 48 inch by 96 inch (1220 mm by 2440 mm).
 - 5. Board Thickness: 1-1/2 inch (38 mm).
 - 6. Board Edges: Square.
 - 7. Water-Resistive Barrier: Integrated film facer on insulation.
 - 8. Type and Compressive Resistance: Type XI, 5 psi (35 kPa), minimum.
 - 9. Type and Water Absorption: Type XI, 4.0 percent by volume, maximum, by total immersion.
 - 10. Type and Thermal Resistance, R-value (RSI-value): Type XI, 3.1 (0.55), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
 - 11. Products:
 - a. Atlas Molded Products, a Division of Atlas Roofing Corporation; ThermalStar EPS Wall Insulation Board: www.atlasmoldedproducts.com/#sle.
 - b. Atlas Molded Products, a Division of Atlas Roofing Corporation; ThermalStar EPS Laminated Wall Insulation (LWI): www.atlasmoldedproducts.com/#sle.
 - c. InsulFoam LLC; InsulFoam ____: www.insulfoam.com/#sle.
 - d. InsulFoam LLC; R-Tech Fanfold (FF) Insulation: www.insulfoam.com/#sle.

- e. Substitutions: See Section 016000 - Product Requirements.
- B. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with either natural skin or cut cell surfaces.
 - 1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
 - 2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
 - 3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
 - 4. Type and Thermal Resistance, R-value (RSI-value 5.8/inch): Type IV, 5.0 (0.88), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
 - 5. Type and Water Absorption: Type XII, 0.3 percent by volume, maximum, by total immersion.
- C. Fire-Resistant Extruded Polystyrene (XPS) Insulation Board: Two rows of high-strength, low-conductive, epoxy-concrete columns in between insulation boards. Columns are fixed to top and bottom surfaces of structural thermal break block, providing load transfer and high-compressive strength to support masonry-framed walls.
 - 1. Compressive Strength: 1500 psi (10342 kPa), when tested in accordance with ASTM D1621.
 - 2. Thermal Conductivity: K (Ksi)-value of 0.46 Btu inch/hr sq ft degrees F (0.066 W/m K), minimum, at 75 degrees F (24 degrees C) mean temperature, when tested in accordance with ASTM C518.
 - 3. Complies with fire-resistance requirements indicated on drawings as part of exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
 - 4. Physical Properties Including Thermal Resistance and Density: R-value (RSI-value): 5.5 (0.97); Type: TBLK-1; 23-5/8 inches by 4 inches by 2-1/2 inches (600 mm by 102 mm by 63.5 mm).
- D. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, comply with ASTM C1289.
 - 1. Classifications:
 - 2. Board Size: 48 inch by 96 inch (1220 mm by 2440 mm).
 - 3. Board Thickness: 1.5 inch (37.5 mm).
 - 4. Board Edges: Square.

2.03 MINERAL FIBER BLANKET INSULATION MATERIALS

- A. Flexible Glass Fiber Blanket Thermal Insulation: Preformed insulation, complying with ASTM C665; friction fit.
 - 1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
 - 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 - 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
 - 4. Formaldehyde Content: Zero.

2.04 ACCESSORIES

- A. Sheet Vapor Retarder: See Section 072600.
- B. Interior Vapor Retarder: Modified polyethylene/polyacrylate (PE/PA) film reinforced with polyethylene terephthalate (PET) fibers, 12 mil, 0.012 inch (0.30 mm) thick.
 - 1. Width: 4.9 feet (1.5 m).
 - 2. Products:
 - a. SIGA Cover Inc; SIGA-Majrex 200: www.siga.swiss/global_en/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- C. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
 - 1. Application: Sealing of interior circular penetrations, such as pipes or cables.
 - 2. Width: Are required for application.
 - 3. Temperature Resistance: Range of minus 40 to 212 degrees F (minus 40 to 100 degrees C).

4. Products:
 - a. SIGA Cover Inc; SIGA-Rissan: www.siga.swiss/global_en/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- D. Flashing Tape: Special reinforced film with high performance adhesive.
 1. Application: Window and door opening flashing tape.
 2. Width: As required for application.
 3. Primer: Tape manufacturer's recommended product.
 4. Products:
 - a. Rmax Inc; R-SEAL 6000: www.rmax.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- E. Air and Moisture Sealing Insulation Fasteners: Preassembled fastener units consisting of sealing washer, screw, and gasketing tube.
 1. Length as required for thickness of insulation material and penetration of deck substrate.
 2. Thread and tip types as required for substrate material.
 3. Products:
 - a. TruFast Walls, a Division of Altenloh, Brinck & Co. US, Inc; Grip-Deck TubeSeal: www.trufastwalls.com/#sle.
- F. Rigid Insulation Pronged Attachment Washers: Solid plastic cap washer with prongs and flexible perimeter seal attached with screws to substrate for attachment of rigid insulation and to help seal against air and moisture penetration through weather barrier assembly.
 1. Products:
 - a. TruFast Walls, a Division of Altenloh, Brinck & Co. US, Inc; Thermal-Grip ci Prong Washer: www.trufastwalls.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION OVER STEEP SLOPE ROOF SHEATHING OR ROOF STRUCTURE

- A. Installation of board insulation over steep slope roof structure or roof sheathing, see Section 061000.

3.03 BATT INSTALLATION

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. At wood framing, place vapor retarder on warm side of insulation by stapling at 6 inches (152 mm) on center. Lap and seal sheet retarder joints over face of member.
- F. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over face of member
- G. Tape seal tears or cuts in vapor retarder.
- H. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane; tape seal in place.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Coordination of Air Barrier Association of America (ABAA) Tests and Inspections:
 - 1. Provide testing and inspection required by ABAA Quality Assurance Program (QAP).
 - 2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
 - 3. Cooperate with ABAA testing agency.
 - 4. Allow access to air barrier work areas and staging.
 - 5. Do not cover air barrier work until tested, inspected, and accepted.

3.05 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 072119 FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Foamed-in-place insulation.
 - 1. In exterior wall crevices.
 - 2. At junctions of dissimilar wall and roof materials.
 - 3. In underside of roofs and ceilings.
- B. Foamed-in-place intumescent insulation, single-layer monolithic system.
- C. Protective intumescent coating.

1.02 REFERENCE STANDARDS

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- B. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).
- C. ASTM D1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics; 2020.
- D. ASTM D1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics; 2017 (Reapproved 2023).
- E. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2019.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- G. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- H. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- I. FM 4880 - Examination Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials; 2022.
- J. NFPA 275 - Standard Method of Fire Tests for the Evaluation of Thermal Barriers; 2022.
- K. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.
- L. UL 1040 - Standard for Safety Fire Test of Insulated Wall Construction; Current Edition, Including All Revisions.
- M. UL 1715 - Standard for Safety Fire Test of Interior Finish Material; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- C. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience, and approved by manufacturer.

- C. Air Barrier Association of America (ABAA) Evaluated Materials Program (EAP); www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Foamed-In-Place Insulation:
1. BASF Corporation; WALLTITE US Series Closed Cell: www.spf.basf.com/#sle.
 2. Carlisle Spray Foam Insulation; ____: www.carlisesfi.com/#sle.
 3. Gaco Western; ____: www.gaco.com/#sle.
 4. Henry Company; ____: www.henry.com/#sle.
 5. Huntsman Building Solutions; Heatlok HFO Pro: www.huntsmanbuildingsolutions.com/#sle.
 6. Johns Manville; JM Corbond High Yield Open-Cell: www.jm.com/#sle.
 7. Substitutions: See Section 016000 - Product Requirements.
- B. Foamed-In-Place Intumescent Insulation:
1. Preferred Solutions, Inc; Staycell ONE STEP 502 Monolithic System: www.preferredsolutions.net/#sle.
 2. Preferred Solutions, Inc; Staycell 504/Staycell ONE STEP 502 Hybrid System: www.preferredsolutions.net/#sle.
 3. Substitutions: See Section 016000 - Product Requirements.
- C. Cellulose Fiber Sprayed Thermal Barrier:
1. Substitutions: See Section 016000 - Product Requirements.

2.02 MATERIALS

- A. Foamed-In-Place Insulation: Low-density, flexible, open cell or closed cell, water vapor permeable polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
1. Regulatory Requirements: Comply with applicable code for flame and smoke, concealment, and fire protection requirements.
 - a. Fire Protection: Provide 15-minute thermal barrier of 1/2 inch (12.7 mm) gypsum board or equivalent material complying with NFPA 275 test method, or foamed-in-place insulation either exposed or with covering that complies with FM 4880, NFPA 286, UL 1040, or UL 1715.
 2. Thermal Resistance: R-value (RSI-value) of 3.0 (0.53), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature when tested in accordance with ASTM C518.
 3. Air Permeance: 0.04 cfm per square foot (0.2 L/(s/sq m)), maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf (75 Pa).
 4. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
 5. Basis of Design:
 - a. Carlisle Spray Foam Insulation; SealTite PRO Open Cell: www.carlisesfi.com/#sle.
 6. Substitutions: See Section 016000 - Product Requirements.
- B. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, open cell or closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
1. Regulatory Requirements: Comply with applicable code for flame and smoke, concealment, and fire protection requirements.
 - a. Fire Protection: Provide 15-minute thermal barrier of 1/2 inch (12.7 mm) gypsum board or equivalent material complying with NFPA 275 test method, or foamed-in-place insulation either exposed or with covering that complies with FM 4880, NFPA 286, UL 1040, or UL 1715.

2. Thermal Resistance: R-value (RSI-value) of 7.1 (1.25), minimum, per 1-inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature when tested in accordance with ASTM C518.
 3. Water Vapor Permeance: Vapor retarder; 2 perms (115 ng/(Pa s sq m)), maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
 4. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.
 5. Air Permeance: 0.04 cfm per square foot (0.2 L/(s/sq m)), maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf (75 Pa).
 6. Closed Cell Content: At least 90 percent.
 7. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
 8. Basis of Design:
 - a. Carlisle Spray Foam Insulation; SealTite PRO One Zero: www.carlislesfi.com/#sle.
 - b. Huntsman Building Solutions; Heatlok HFO Pro: www.huntsmanbuildingsolutions.com/#sle.
 9. Other Acceptable Products:
 10. Substitutions: See Section 016000 - Product Requirements.
- C. Foamed-In-Place Intumescent Insulation (Single-Layer Monolithic System): Medium-density, rigid, two-part, closed cell polyurethane foam; foamed on-site using blowing agent of non-ozone-depleting gas.
1. Regulatory Requirements: Comply with applicable code for flame and smoke, concealment, and fire protection requirements.
 - a. Fire Protection: Provide 15-minute thermal barrier of 1/2 inch (12.7 mm) gypsum board or equivalent material complying with NFPA 275 test method, or foamed-in-place insulation either exposed or with covering that complies with FM 4880, NFPA 286, UL 1040, or UL 1715.
 2. Thermal Resistance: R-value (RSI-value) of 5.7 (1.0), minimum, per 1 inch (25.4 mm) thickness at 140 degrees F (60 degrees C) mean temperature, at 90 days, when tested in accordance with ASTM C518.
 3. Water Vapor Permeance: 0.99 perms (56.64 ng/(Pa s sq m)), maximum, when tested at 3.5 inch (89 mm) thickness in accordance with ASTM E96/E96M.
 4. Air Permeance: 0.002 cfm per sq ft (0.011 L/(s/sq m)), maximum, when tested at 1 inch (25.4 mm) thickness in accordance with ASTM E2178 at 1.57 psf (75 Pa).
 5. Closed Cell Content: At least 90 percent.
 6. Density: 2.0 lbs/cu ft (32 kg/cu m), nominal, in accordance with ASTM D1622.
 7. Tensile Strength: 55 psi (379 kPa), minimum, in accordance with ASTM D1623.
 8. Compressive Strength: 22 psi (152 kPa), minimum, in accordance with ASTM D1621.
 9. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, at 4 inch (102 mm) thick when tested in accordance with ASTM E84.
 10. Basis of Design:
 - a. Preferred Solutions, Inc; Staycell ONE STEP 502 Single-Layer Monolithic System: www.preferredsolutions.net/#sle.
 11. Substitutions: See Section 016000 - Product Requirements.

2.03 ACCESSORIES

- A. Primer: As required by insulation manufacturer.
- B. Protective Coating: Sprayed, treated with flame retardants as required to comply with applicable codes.
 1. Coating Type: Recycled paper.
 2. Thermal Resistance, R-value (RSI-value): 4.5 (0.79), at 1 1/2 inch (38.1 mm) thickness when tested in accordance with ASTM C518.
 3. Noise Reduction Coefficient (NRC): 0.95 for 1-1/4-inch (31.7 mm) thickness installed over foam.

4. Bond Strength: 100 psf (488 kPa), minimum.
5. Flame Spread/Smoke Developed Index: 5/5, Class A, when tested in accordance with ASTM E84.
6. Color: As indicated on drawings.
7. Products:
 - a. International Cellulose Corporation; Ure-K 15-Minute Thermal Barrier: www.spray-on.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify work within construction spaces or crevices is complete before insulation application.
- B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.02 PREPARATION

- A. Mask and protect adjacent surfaces from over spray or dusting.
- B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

- A. Apply insulation in accordance with manufacturer's instructions.
- B. Apply insulation by spray method, to a uniform monolithic density without voids.
- C. Apply protective coating to a uniform minimum thickness of ____ inch (____ mm), to achieve fire rating required.
- D. Trim excess away for applied trim or remove as required for continuous sealant bead.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Field inspections and tests will be performed by an independent testing agency.

3.05 PROTECTION

- A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION

SECTION 072500 WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water-resistive barriers.

1.02 RELATED REQUIREMENTS

- A. Section 072100 - Thermal Insulation: Weather barrier installed in conjunction with batt insulation.
- B. Section 076200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.

1.03 DEFINITIONS

- A. Weather Barriers: Materials or assemblies forming water-resistive barriers, air barriers, vapor retarders, or combination of one or more assemblies.
- B. Water-Resistive Barriers: Materials or assemblies installed behind exterior wall coverings; designed to prevent liquid water from further penetration into exterior wall assembly.

1.04 REFERENCE STANDARDS

- A. AATCC Test Method 127 - Test Method for Water Resistance: Hydrostatic Pressure; 2018, with Editorial Revision (2019).
- B. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017 (Reapproved 2023).
- C. ASTM D779 - Standard Test Method for Determining the Water Vapor Resistance of Sheet Materials in Contact with Liquid Water by the Dry Indicator Method; 2016.
- D. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.
- E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- F. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. ICC-ES AC308 - Acceptance Criteria for Water-Resistive Barriers; 2016, with Editorial Revision (2021).
- H. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.

1.06 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.01 WATER-RESISTIVE BARRIERS

- A. Description: Materials installed behind exterior wall coverings; designed to prevent liquid water from further penetration into exterior wall assembly. Primary materials include mechanically applied sheets; accessory materials include flashings and seam tapes.
- B. Regulatory Requirements: For use in ICC (IBC) construction Types I, II, III, and IV buildings greater than 40 feet (12.2 m) in height.
 - 1. Comply with NFPA 285 wall assembly requirements in accordance with local building code and authorities having jurisdiction (AHJ).

- C. Asphalt Felt: ASTM D226/D226M, Type I, No.15 asphalt felt.
- D. Building Paper: Asphalt-saturated kraft Grade D type sheathing paper complying with ICC-ES AC38.
 - 1. Water Resistance: At least 60 minutes when tested in accordance with ASTM D779.
 - 2. Water Vapor Permeance: 29 perms (1,658 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F (23 degrees C).
 - 3. Products:
 - a. Henry Company; Super Jumbo Tex 60 Minute: www.henry.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- E. Plastic Sheet: Polymeric-based sheet complying with requirements of ICC-ES AC38, Grade D, with 60-minute water resistance; polyethylene sheet is not permitted.
 - 1. Water Resistance: Withstand hydrostatic head of 157 inches (400 cm), minimum, for at least five hours; pass test method in accordance with AATCC Test Method 127.
 - 2. Products:
 - a. National Shelter Products, Inc; DRYline LP: www.nationalshelter.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- F. Water-Resistive Breathable Barrier: Woven, polyolefin fabric sheet in accordance with ASTM D779, 60-minute water resistance.
 - 1. Water Vapor Permeance: 10 perms (574 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M, method A.
 - 2. Products:
 - a. National Shelter Products, Inc; DRYline W: www.nationalshelter.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- G. Water-Resistive Barrier Building Wrap: Mechanically fastened building wrap.
 - 1. Hydrostatic Pressure Resistance: Greater than 200 inches (500 cm) when tested in accordance with AATCC Test Method 127.
 - 2. Water Resistance: Exceeds 1 hour when tested in accordance with ASTM D779.
 - 3. Water Vapor Permeance: 9 to 15 perms (510 to 860 ng/(Pa s sq m)) when tested in accordance with ASTM E96/E96M, Procedure A.

2.02 ACCESSORIES

- A. Seal and Perimeter Tapes: As recommended by water-resistive barrier manufacturer.
- B. Flashings and Sealants: As recommended by water-resistive barrier manufacturer for application.
- C. Building Insulation: See Section 072100.
- D. Metal Flashings: See Section 076200.
- E. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and weather barrier materials.
 - 1. Application: Apply at 30 to 40 mil, 0.030 to 0.040 inch (0.76 to 1.02 mm) nominal thickness.
 - 2. Color: Green.
- F. Flexible Flashing: Self-adhering sheet flashing complying with ASTM D1970/D1970M; waive slip resistance requirement if not installed on roof.
 - 1. Width: 3 inches (76.2 mm).
 - 2. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 30 days of weather exposure.
 - 3. Products:
 - a. DuPont de Nemours, Inc; FlexWrap: www.dupont.com/building/#sle.
 - b. DuPont de Nemours, Inc; StraightFlash: www.dupont.com/building/#sle.
 - c. DuPont de Nemours, Inc; VersaFlange: www.dupont.com/building/#sle.

- d. Henry Company; FortiFlash: www.henry.com/#sle.
- e. Henry Company; FortiFlex Butyl: www.henry.com/#sle.
- f. Henry Company; FortiFlash Butyl: www.henry.com/#sle.
- g. SIGA Cover Inc; SIGA-Wigluv: www.siga.swiss/global_en/#sle.
- h. Substitutions: See Section 016000 - Product Requirements.

2.03 FASTENERS

- A. Air- and Moisture-Sealing Insulation Fasteners: Preassembled fastener units consisting of sealing washer, screw, and gasketing tube.
 - 1. Length as required for thickness of insulation material and penetration of deck substrate.
 - 2. Thread and tip types as required for substrate material.
 - 3. Products:
 - a. TruFast Walls, a Division of Altenloh, Brinck & Co. US, Inc; Grip-Deck TubeSeal: www.trufastwalls.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- B. Self-Sealing Washers: Solid plastic, 2 inch (25 mm) diameter washers; seals building-wrap air barriers against air penetration.
 - 1. Products:
 - a. TruFast Walls, a Division of Altenloh, Brinck & Co. US, Inc; Thermal-Grip Flat Washer: www.trufastwalls.com/#sle.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions comply with requirements of this section.

3.02 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's installation instructions.
- B. Install continuous water-resistive barriers where indicated on drawings, with sheets lapped to shed water.
- C. Apply sealants within recommended temperature range in accordance with manufacturer's installation instructions.
- D. Mechanically Fastened Sheets:
 - 1. Install sheets in shingle fashion to shed water; align horizontally.
 - 2. Overlap seams as recommended by manufacturer, 6 inches (152 mm), minimum.
 - 3. Overlap at outside and inside corners as recommended by manufacturer, 12 inches (305 mm), minimum.
 - 4. Attach to framed construction with fasteners extending through sheathing into framing, and space fasteners at 12 to 18 inches (305 to 460 mm) on center along each framing member supporting sheathing.
 - 5. Attach to masonry construction using mechanical fasteners spaced at 12 to 18 inches (305 to 460 mm) vertically on center, and at 24 inches (610 mm), maximum, horizontally on center.
 - 6. For applications indicated to be airtight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners as recommended by manufacturer.

7. Where stud framing rests on concrete or masonry substrate, extend lower edge of barrier sheets at least 4 inches (102 mm) below bottom of framing and seal to substrate with sealant or approved mounting tape.
 8. Install water-resistive barrier over jamb flashings.
 9. Install head flashings under water-resistive barrier.
 10. At framed openings with frames having nailing flanges, extend sheet into opening and over flanges; at head of opening, seal sheet over flange and flashing.
- E. Self-Adhered Sheets:
1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
 2. Lap sheets shingle-fashion to shed water and seal laps airtight.
 3. Upon placement of sheets, firmly press onto substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
 4. Use same material, or other material approved by sheet manufacturer, to seal sheets to adjacent substrates, and as flashing.
 5. At expansion joints, provide transition to joint assemblies approved by sheet manufacturer.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Owner's Inspection and Testing: Cooperate with Owner's testing agency.
1. Allow access to work areas and staging.
 2. Notify Owner's testing agency in writing of schedule for work of this section to allow sufficient time for testing and inspection.
 3. Do not cover work of this section until testing and inspection is accepted.

3.05 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 072600 VAPOR RETARDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Vapor retarders.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.
- B. Section 072100 - Thermal Insulation: Vapor retarder installed in conjunction with batt insulation.
- C. Section 076200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with vapor retarders.

1.03 DEFINITIONS

- A. Vapor Retarder: Airtight barrier made of material that is relatively water vapor impermeable, to degree specified, with seams and joints sealed to adjacent surfaces.
- B. Vapor Retarder Class: A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class is defined using Procedure A, Desiccant Method at 73 degrees F (23 degrees C) and 50 percent Relative Humidity (RH), in accordance with ASTM E96/E96M and ICC (IBC)-2018, as follows:
 - 1. Class I: 0.1 perm or less.
 - 2. Class II: Greater than 0.1 perm to 1.0 perm.
 - 3. Class III: Greater than 1.0 perm to 10 perms.
 - 4. Vapor Permeable: 5 perms or greater.

1.04 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
- B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- C. ASTM D751 - Standard Test Methods for Coated Fabrics; 2019.
- D. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2017).
- E. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.
- F. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications; 2016 (Reapproved 2023).
- G. ASTM D5590 - Standard Test Method for Determining the Resistance of Paint Films and Related Coatings to Fungal Defacement by Accelerated Four-Week Agar Plate Assay; 2017 (Reapproved 2021).
- H. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- I. ICC (IBC)-2018 - International Building Code; 2018.
- J. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; 2015, with Editorial Revision (2020).

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.01 VAPOR RETARDERS

- A. Underslab Vapor Retarders: See Section 033000.
- B. Vapor Retarder Sheet: Polyethylene sheeting complying with ASTM D4397, clear colored.
 - 1. Thickness: 10 mil, 0.010 inch (0.254 mm), nominal.
 - 2. Products:
 - a. Tex-Trude; _____: www.tex-trude.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- C. Vapor Retarder Coating: Liquid applied, resilient, ultra-violet (UV) light resistant coating; associated joint treatment.
 - 1. Water Vapor Permeance: 1.0 perm (57 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M.
 - 2. VOC Content: Less than 6.68 oz/gal (50 g/L), when tested in accordance with 40 CFR 59, Subpart D - EPA Method 24.
 - 3. Resistance to Fungal Growth: No growth when tested in accordance with ASTM D5590.
 - 4. Code Acceptance: Comply with applicable requirements of ICC-ES AC212.
 - 5. Suitable for use on concrete, masonry, plywood, and gypsum sheathing.
 - 6. Joint Preparation Treatment: Provide coating manufacturer's recommended method, either tape or reinforcing mesh saturated with coating material.
 - 7. Joint Filler: As recommended by coating manufacturer and suitable to the substrate.
 - 8. Products:
 - a. Substitutions: See Section 016000 - Product Requirements.

2.02 ACCESSORIES

- A. Sealants, Tapes, and Accessories for Sealing Vapor Retarder and Adjacent Substrates: As indicated, complying with vapor retarder manufacturer's installation instructions.
- B. Sealant for Cracks and Joints in Substrates: Resilient elastomeric joint sealant compatible with substrates and vapor retarder materials.
 - 1. Application: Apply at 30 to 40 mil, 0.030 to 0.040 inch (0.76 to 1.02 mm), nominal thickness.
 - 2. Color: Green.
 - 3. Elongation: 1,300 percent, measured in accordance with ASTM D412.
 - 4. Peel Adhesion: 28 lb/inch (5.0 kg/cm), minimum, when tested in accordance with ASTM D903.
 - 5. Hydrostatic Head Pressure: Resists head pressure of 57 feet (17.4 m), maximum, when tested in accordance with ASTM D751.
 - 6. Products:
 - a. Substitutions: See Section 016000 - Product Requirements.
- C. Primer: Liquid applied polymer.
 - 1. Color: Green.
 - 2. Products:
 - a. Rubber Polymer Company; Rub-R-Wall SA Primer: www.rpcinfo.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

- D. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M; slip resistance requirement waived if not installed on roof.
 - 1. Width: 4 inches (102 mm).
 - 2. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 30 days of weather exposure.
 - 3. Products:
 - a. DuPont de Nemours, Inc; DuPont FlexWrap: www.dupont.com/building/#sle.
 - b. DuPont de Nemours, Inc; DuPont StraightFlash: www.dupont.com/building/#sle.
 - c. Henry Company; FortiFlash: www.henry.com/#sle.
 - d. Henry Company; FortiFlex Butyl: www.henry.com/#sle.
 - e. Substitutions: See Section 016000 - Product Requirements.
- E. Vapor Retarder Tape: Coated polyester film with acrylic adhesive backing; pressure sensitive.
 - 1. Products:
 - a. Henry Company; Henry Sheathing Tape: www.henry.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions comply with requirements of this section.

3.02 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's installation instructions.
- B. Vapor Retarders: Install continuous airtight barrier over surfaces indicated, with sealed seams and sealed joints to adjacent surfaces.
- C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.
- D. Mechanically Fastened Sheets - Vapor Retarder On Exterior:
 - 1. Install sheets shingle fashion to shed water, with seams generally horizontal.
 - 2. Overlap seams as recommended by manufacturer, 6 inches (152 mm), minimum.
 - 3. Overlap at outside and inside corners as recommended by manufacturer, 12 inches (305 mm), minimum.
 - 4. Attach to framed construction with fasteners extending through sheathing into framing, and space fasteners at 12 to 18 inches (305 to 460 mm) on center along each framing member supporting sheathing.
 - 5. Attach to masonry construction using mechanical fasteners spaced at 12 to 18 inches (305 to 460 mm) vertically on center, and at 24 inches (610 mm), maximum, horizontally on center.
 - 6. For applications indicated to be airtight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners as recommended by manufacturer.
 - 7. Where stud framing rests on concrete or masonry substrate, extend lower edge of vapor retarder sheet at least 4 inches (102 mm) below bottom of framing and seal to substrate with sealant or approved mounting tape.
 - 8. Install vapor retarder underneath jamb flashings.
 - 9. At framed openings with frames having nailing flanges, extend sheet into opening and over flanges; at head of opening, seal sheet over flange and flashing.
- E. Mechanically Fastened Sheets - Vapor Retarder On Interior:

1. When insulation is installed within assembly, install vapor retarder over insulation.
 2. Anchor to wood framing using large-headed nails or staples at 12 to 18 inches (305 to 460 mm) on center along each framing member covered; cover fasteners with seam tape.
 3. Anchor to metal framing using seam tape, adhering at least one-half of tape width to metal substrate.
 4. Seal seams, laps, perimeter edges, penetrations, tears, and cuts with self-adhesive tape, providing an airtight seal.
 5. Locate laps at framing members; at laps fasten one sheet to framing member then tape overlapping sheet to first sheet in shingle fashion to shed water.
 6. Seal entire perimeter to structure, window and door frames, and other penetrations.
 7. Where conduits, pipes, wires, ducts, outlet boxes, and other items are installed within insulation cavity, pass vapor retarder sheet behind these items and over insulation to maintain airtight seal.
- F. Self-Adhered Sheets:
1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
 2. Lap sheets shingle fashion to shed water and seal laps airtight.
 3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
 4. Use same material, or other material approved by sheet manufacturer, to seal sheets to adjacent substrates, and as flashing.
 5. At expansion joints, provide transition to joint assemblies approved by sheet manufacturer.
- G. Vapor Retarder Coatings:
1. Prepare substrate in accordance with coating manufacturer's installation instructions; treat joints in substrate and between dissimilar materials as indicated.
 2. Apply flashing to seal with adjacent construction and to bridge joints in coating substrate.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Owner's Inspection and Testing: Cooperate with Owner's testing agency.
1. Allow access to work areas and staging.
 2. Notify Owner's testing agency in writing of schedule for work of this section to allow sufficient time for testing and inspection.
 3. Do not cover work of this section until testing and inspection is accepted.
- C. Take digital photographs of each portion of installation prior to covering up vapor retarders.

3.05 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 072700 AIR BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Air barriers.

1.02 RELATED REQUIREMENTS

- A. Section 061000 - Rough Carpentry: Air barrier under exterior cladding.
- B. Section 061000 - Rough Carpentry: Sheathing with integral air barrier.
- C. Section 076200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with air barriers.
- D. Section 092116 - Gypsum Board Assemblies: Air barrier under exterior cladding.

1.03 DEFINITIONS

- A. Air Barrier: Airtight barrier made of material that is virtually air impermeable but water vapor permeable, both to amount as specified, with sealed seams and sealed joints to adjacent surfaces.

1.04 REFERENCE STANDARDS

- A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- C. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- D. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on material characteristics, performance criteria, limitations, and _____.

1.06 QUALITY ASSURANCE

- A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
 - 1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
- B. Air Barrier Association of America (ABAA) Evaluated Air Barrier Assemblies; www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.

PART 2 PRODUCTS

2.01 AIR BARRIER MATERIALS (AIR IMPERMEABLE AND WATER VAPOR PERMEABLE)

- A. Air Barrier Sheet, Mechanically Fastened:
 - 1. Air Permeance: 0.004 cfm/sq ft (0.02 L/(s sq m)), maximum, when tested in accordance with ASTM E2178.
 - 2. Water Vapor Permeance: 10 perms (574 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F (23 degrees C).

3. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
 4. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 50 or less, Class A, when tested in accordance with ASTM E84.
 5. Seam and Perimeter Tape: Polyethylene self-adhering type, mesh reinforced, 2-1/2 inches (64 mm) wide, compatible with sheet material; unless otherwise indicated.
 6. Products:
 - a. Alpha Pro Tech, Inc; REX Wrap Fortis Commercial: www.alphaprotech.com/#sle.
 - b. Carlisle Coatings and Waterproofing, Inc; CCW 705 RS: www.carlisleccw.com/#sle.
 - c. DuPont de Nemours, Inc; Tyvek Construction Wrap with Tyvek Fluid Applied Flashing - Brush Formulation, Tyvek Fluid Applied Flashing and Joint Compound, FlexWrap, StraightFlash, VersaFlange, Tyvek Wrap Caps, and Tyvek Tape: building.dupont.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- B. Air Barrier Sheet, Self-Adhered:
1. Air Permeance: 0.004 cfm/sq ft (0.02 L/(s sq m)), maximum, when tested in accordance with ASTM E2178.
 2. Water Vapor Permeance: 10 perms (572 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F (23 degrees C).
 3. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
 4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
 5. Seam and Perimeter Tape: As recommended by sheet manufacturer.
 6. Products:
 - a. Carlisle Coatings and Waterproofing, Inc; Fire Resist 705 VP: www.carlisleccw.com/#sle.
 - b. Carlisle Coatings and Waterproofing, Inc; Fire Resist 705 HT (High Temperature): www.carlisleccw.com/#sle.
 - c. SIGA Cover Inc; SIGA-Majvest 500 SA: www.siga.swiss/global_en/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- C. Air Barrier, Fluid Applied: Vapor semi-permeable, elastomeric waterproofing.
1. Air Barrier Coating:
 - a. Air Permeance: 0.004 cfm/sq ft (0.02 L/(s sq m)), maximum, when tested in accordance with ASTM E2178.
 - b. Water Vapor Permeance: 11 perms (629 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M using Procedure B - Water Method, at 73.4 degrees F (23 degrees C).
 - c. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
 - d. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
 - e. Products:
 - 1) AVM Industries, Inc; Aussie Shield 300-PLM: www.avmindustries.com/#sle.
 - 2) Dow Chemical Company; DOWSIL DefendAir 200C: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
 - 3) DuPont de Nemours, Inc; Tyvek Fluid Applied WB+ with Tyvek Fluid Applied Flashing and Joint Compound, Sealant for Tyvek Fluid Applied System, and StraightFlash: building.dupont.com/#sle.
 - 4) GCP Applied Technologies; Perm-A-Barrier VPL 50RS UV Stable: www.gcpat.com/#sle.
 - 5) Substitutions: See Section 016000 - Product Requirements.
 2. Air Barrier Membrane:

- a. Material: Water-based acrylic.
- b. Dry Film Thickness (DFT): 30 mil, 0.030 inch (0.762 mm), minimum.
- c. Air Permeance: 0.004 cfm/sq ft (0.02 L/(s sq m)), maximum, when tested in accordance with ASTM E2178.
- d. Water Vapor Permeance: 11 perms (629 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M using Procedure B - Water Method, at 73.4 degrees F (23 degrees C).
- e. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
- f. Products:
 - 1) Carlisle Coatings and Waterproofing, Inc; Fire Resist Barritech-VP: www.carlisleccw.com/#sle.
 - 2) Sika Corporation; Senershield-R/RS: www.usa.sika.com/en/construction/eifs-stucco.html/#sle.
 - 3) Tremco Commercial Sealants & Waterproofing; ExoAir 230: www.tremcosealants.com/#sle.
 - 4) Substitutions: See Section 016000 - Product Requirements.

2.02 AIR BARRIER MATERIALS (AIR IMPERMEABLE AND WATER VAPOR IMPERMEABLE)

- A. Air and Vapor Barrier Sheet, Mechanically Fastened: Two layers of aluminum over layer of woven polyethylene, used to separate space with conditioned air from adjacent space without conditioned air, such as knee walls exposed to attic conditions.
 1. Air Permeance: 0.004 cfm/sq ft (0.02 L/(s sq m)), maximum, when tested in accordance with ASTM E2178.
 2. Water Vapor Permeance: 0.1 perms (5.7 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M using Procedure B - Water Method.
 3. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
 4. Seam and Perimeter Tape: As recommended by sheet manufacturer.
 5. Products:
 - a. Fi-Foil Company, Inc; SkyFlex (Solid): www.fifoil.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- B. Air and Vapor Barrier Sheet, Self-Adhered:
 1. Air Permeance: 0.004 cfm/sq ft (0.02 L/(s sq m)), maximum, when tested in accordance with ASTM E2178.
 2. Water Vapor Permeance: 0.1 perms (5.72 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M using Procedure B - Water Method.
 3. Seam and Perimeter Tape: As recommended by sheet manufacturer.
 4. Products:
 - a. Carlisle Coatings and Waterproofing, Inc; Fire Resist 705FR-A: www.carlisleccw.com/#sle.
 - b. Carlisle Coatings and Waterproofing, Inc; Fire Resist 705 FR-A XLT (Xtra Low Temperature): www.carlisleccw.com/#sle.
 - c. SIGA Cover Inc; SIGA-Majrex 200: www.siga.swiss/global_en/#sle.
 - d. Tremco Commercial Sealants & Waterproofing; ExoAir 110AT: www.tremcosealants.com/#sle.
 - e. Substitutions: See Section 016000 - Product Requirements.
- C. Air and Vapor Barrier, Fluid-Applied:
 1. Air Permeance: 0.004 cfm/sq ft (0.02 L/(s sq m)), maximum, when tested in accordance with ASTM E2178.
 2. Water Vapor Permeance: 1 perm (57.21 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F (23 degrees C).

3. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 60 days of weather exposure.
4. Products:
 - a. Carlisle Coatings and Waterproofing, Inc; Fire Resist Barritech NP: www.carlisleccw.com/#sle.
 - b. Carlisle Coatings and Waterproofing, Inc; Fire Resist Barritech NP-LT (Low Temperature): www.carlisleccw.com/#sle.
 - c. Tremco Commercial Sealants & Waterproofing; ExoAir 120: www.tremcosealants.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- D. Air and Vapor Barrier Insulation, Foamed-in-Place: Medium-density, rigid or semirigid, closed-cell polyurethane foam; foamed on-site using blowing agent of water or non-ozone-depleting gas.
 1. Regulatory Requirements: Comply with local building code for flame and smoke, concealment, and overcoat limitations.
 2. Air Permeance: 0.004 cfm/sq ft (0.02 L/(s sq m)), maximum, when tested in accordance with ASTM E2178.
 3. Water Vapor Permeance: 0.70 perms (40 ng/(Pa s sq m)), maximum, when tested at 2 inches (51 mm) thick in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F (23 degrees C).
 4. Closed Cell Content: At least 90 percent.
 5. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.

2.03 ACCESSORIES

- A. Sealants, Tapes, and Accessories for Sealing Air Barrier and Adjacent Substrates: As indicated or in compliance with air barrier manufacturer's installation instructions.
- B. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrate and air barrier materials.
 1. Application: Apply at 30 to 40 mil, 0.030 to 0.040 inch (0.76 to 1.02 mm), nominal thickness.
 2. Color: Green.
 3. Products:
 - a. Karnak Corporation; 323 K-NRG Gap Seal FR: www.karnakcorp.com/#sle.
 - b. Rubber Polymer Company; Rub-R-Wall Mastic: www.rpcinfo.com/#sle.
- C. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement waived if not installed on roof.
 1. Width: 4 inches (100 mm).
 2. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 30 days of weather exposure.
 3. Products:
 - a. DuPont de Nemours, Inc; DuPont FlexWrap: www.dupont.com/building/#sle.
 - b. DuPont de Nemours, Inc; DuPont StraightFlash: www.dupont.com/building/#sle.
 - c. DuPont de Nemours, Inc; DuPont VersaFlange: www.dupont.com/building/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions are ready for work of this section.
- B. Where existing conditions are responsibility of another installer, notify Architect of unsatisfactory conditions.
- C. Do not proceed with this work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's installation instructions.
- B. Air Barriers: Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.
- D. Mechanically Fastened Sheets - On Exterior:
 - 1. Install sheets shingle fashion to shed water, with seams generally horizontal.
 - 2. Overlap seams as recommended by manufacturer, 6 inches (152 mm), minimum.
 - 3. Overlap at outside and inside corners as recommended by manufacturer, 12 inches (305 mm), minimum.
 - 4. Attach to framed construction with fasteners extending through sheathing into framing, and space fasteners at 12 to 18 inches (305 to 460 mm) on center along each framing member supporting sheathing.
 - 5. For applications indicated to be airtight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners as recommended by manufacturer.
 - 6. Install air barrier underneath jamb flashings.
 - 7. At framed openings with frames having nailing flanges, extend sheet into opening and over flanges; at head of opening, seal sheet over flange and flashing.
- E. Self-Adhered Sheets:
 - 1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
 - 2. Lap sheets shingle fashion to shed water and seal laps airtight.
 - 3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
 - 4. Use same material, or other material approved by sheet manufacturer, to seal to adjacent substrates, and as flashing.
 - 5. At wide joints, provide extra flexible membrane allowing joint movement.
- F. Fluid-Applied Coatings or Membranes:
 - 1. Prepare substrate in accordance with manufacturer's installation instructions; treat joints in substrate and between dissimilar materials as indicated.
 - 2. Use flashing to seal to adjacent construction and to bridge joints in coating substrate.
- G. Openings and Penetrations in Exterior Air Barriers:
 - 1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches (125 mm) onto air barrier and at least 6 inches (150 mm) up jambs; mechanically fasten stretched edges.
 - 2. At openings with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches (100 mm) wide; do not seal sill flange.
 - 3. At openings with nonflanged frames, seal air barrier to each side of framing at opening using flashing at least 9 inches (230 mm) wide, and covering entire depth of framing.
 - 4. At head of openings, install flashing under air barrier extending at least 2 inches (50 mm) beyond face of jambs; seal air barrier to flashing.
 - 5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.

6. Service and Other Penetrations: Form flashing around penetrating item and seal to air barrier surface.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Coordination of ABAA Tests and Inspections:
 1. Provide testing and inspection required by ABAA QAP.
 2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
 3. Cooperate with ABAA testing agency.
 4. Allow access to air barrier work areas and staging.
 5. Do not cover air barrier work until tested, inspected, and accepted.
- C. Do not cover installed air barriers until required inspections have been completed.
- D. Obtain approval of installation procedures from air barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
- E. Take digital photographs of each portion of installation prior to covering up air barriers.

3.05 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 074113 METAL ROOF PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Insulated metal roof panel system of preformed aluminum panels.
- B. Metal roof panel system of preformed aluminum panels.

1.02 RELATED REQUIREMENTS

- A. Section 051200 - Structural Steel Framing: Roof framing and purlins.
- B. Section 061000 - Rough Carpentry: Roof sheathing.
- C. Section 072100 - Thermal Insulation: Rigid roof insulation.
- D. Section 074213 - Metal Wall Panels: Preformed wall panels.
- E. Section 079200 - Joint Sealants: Sealing joints between metal roof panel system and adjacent construction.
- F. Section 099113 - Exterior Painting: Field priming and painting roofing panels.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- D. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
- E. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- F. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017 (Reapproved 2023).
- G. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.
- H. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- I. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference; 2005 (Reapproved 2017).

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Storage and handling requirements and recommendations.
 - 2. Installation methods.
 - 3. Specimen warranty.
- C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
 - 1. Show work to be field-fabricated or field-assembled.
 - 2. Include structural analysis signed and sealed by qualified structural engineer, indicating compliance of roofing system to specified loading conditions.

- D. Test Reports: Indicate compliance of metal roofing system to specified requirements.
- E. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Provide strippable plastic protection on prefinished roofing panels for removal after installation.
- C. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Structural Metal Roof Panel Manufacturers:
 - 1. MBCI, a Cornerstone Building Brands Company; 7.2 Panel: www.mbc.com/#sle.
 - 2. Taylor Metal Products; BR - 36: www.taylormetal.com/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.
- B. Architectural Metal Roof Panel Manufacturers:
 - 1. ATAS International, Inc; Colonial Seam: www.atas.com/#sle.
 - 2. Englert, Inc; A1300: www.englertinc.com/#sle.
 - 3. MBCI, a Cornerstone Building Brands Company; 5V Crimp Panel: www.mbc.com/#sle.
 - 4. Metal Roofing Systems, Inc; System 1000 - Metal Roof Panels: www.metalroofingsystems.biz/#sle.
 - 5. Metl-Span, a Nucor Company: www.metlspan.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.
- C. Metal Soffit Panels Manufacturers:
 - 1. Englert, Inc: www.englertinc.com/#sle.
 - 2. MBCI, a Cornerstone Building Brands Company; Artisan Panel: www.mbc.com/#sle.
 - 3. McElroy Metal: www.mcelroymetal.com/#sle.
 - 4. Metal Roofing Systems, Inc: www.metalroofingsystems.biz/#sle.
 - 5. Morin Corporation; Primo Soffit: www.morincorp.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.
- D. Retrofit Roof Panels:
 - 1. MBCI, a Cornerstone Building Brands Company; Retro-R Panel: www.mbc.com/#sle.
 - 2. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Metal Roof Panels: Provide complete roofing assemblies, including roof panels, clips, fasteners, connectors, and miscellaneous accessories, tested for compliance with the following minimum standards:
 - 1. Structural Design Criteria: Provide panel assemblies designed to safely support design loads at support spacing indicated, with deflection not to exceed L/180 of span length(L) when tested in accordance with ASTM E1592.

- a. Dead Loads: Weight of roofing system.
- b. Live Loads: As required by ASCE 7.
2. Overall: Complete weathertight system tested and approved in accordance with ASTM E1592.
3. Thermal Movement: Design system to accommodate without deformation anticipated thermal movement over ambient temperature range of 100 degrees F (56 degrees C).

2.03 METAL ROOF PANELS

- A. Metal Roof Panels: Provide complete engineered system complying with specified requirements and capable of remaining weathertight while withstanding anticipated movement of substrate and thermally induced movement of roofing system.
- B. Metal Panels: Factory-formed panels with factory-applied finish.
 1. Aluminum Panels:
 - a. Alloy and Temper: Aluminum complying with ASTM B209/B209M; temper as required for forming.
 - b. Thickness: Minimum 20 gauge, 0.032 inch (0.81 mm).
 2. Profile: Standing seam, with minimum 1-inch (25.4 mm) seam height; concealed fastener system for field seaming with special tool.
 3. Texture: Smooth.
 4. Width: Maximum panel coverage of 24 inches (610 mm).
- C. Metal Soffit Panels:
 1. Profile: Style as indicated, with venting provided.
 2. Material: Precoated steel sheet, 22 gauge, 0.0299 inch (0.76 mm) minimum thickness.
 3. Color: As selected by Architect from manufacturer's standard line.

2.04 ATTACHMENT SYSTEM

- A. Concealed System: Provide manufacturer's standard stainless steel or nylon-coated aluminum concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

2.05 SECONDARY FRAMING

- A. Miscellaneous Secondary Framing: Light gauge steel framing incidental to structural supports; fabricated from steel sheet.
- B. Framing Material: ASTM A1011/A1011M Designation SS steel sheet.
 1. Profile: Manufacturer's standard cee, zee, asymmetrical zee, hat channel, plain channel, single slope eave strut, double slope eave strut, and angle.
 2. Thickness: 12 gauge, 0.1046 inch (2.657 mm).
 3. Finish: Galvanized per ASTM A653/A653M, G90.
- C. Framing Connectors: Factory-made formed steel sheet, ASTM A653/A653M SS Grade 50, with G60/Z180 hot dipped galvanized coating and factory punched holes.

2.06 FABRICATION

- A. Panels: Provide factory or field fabricated panels with applied finish and accessory items, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.

2.07 FINISHES

- A. Fluoropolymer Coil Coating System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, and at least 80 percent of coil coated metal surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch (0.023 mm); color and gloss as selected by Architect from manufacturer's standard line.
 1. Products:
 - a. Arkema, Inc; Kynar 500: www.arkema.com/#sle.

- b. Substitutions: See Section 016000 - Product Requirements.

2.08 ACCESSORIES

- A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, and equipment curbs of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.
- B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish or combination steel and closed-cell foam.
- C. Sealants:
 - 1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
 - 2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
- D. Underlayment for Wood Substrate: ASTM D226/D226M roofing felt, perforated type; covered by water-resistant rosin-sized building paper.
- E. Underlayment: Self-adhering polymer modified asphalt sheet complying with ASTM D1970/D1970M, with strippable release film and top surface of woven polypropylene sheet.
 - 1. Sheet Thickness: 22 mils, 0.022 inch (0.55 mm), minimum.
 - 2. Water Vapor Permeance: 0.1 perm (5.72 ng/Pa s sq m), maximum, when tested in accordance with ASTM E96/E96M using Desiccant Method (Method A).
 - 3. Products:
 - a. Certaineed Roofing; WinterGuard HT - High Temperature Waterproofing Underlayment: www.certaineed.com/#sle.
 - b. Henry Company; Blueskin RF200: www.henry.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation of preformed metal roof panels until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Broom clean wood sheathing prior to installation of roofing system.
- B. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to ensure that completed roof will be free of leaks.
- C. Remove protective film from surface of roof panels immediately prior to installation; strip film carefully to avoid damage to prefinished surfaces.
- D. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by metal roof panel manufacturer.
- E. At locations where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.03 INSTALLATION

- A. Overall: Install roofing system in accordance with approved shop drawings and metal roof panel manufacturer's instructions and recommendations, as applicable to specific project conditions; securely anchor components of roofing system in place allowing for thermal and structural movement.
 - 1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.

2. Install roofing system with exposed fasteners prefinished to match panels.
 3. Minimize field cutting of panels. Where field cutting is required, use methods that will not distort panel profiles. Use of torches for field cutting is prohibited.
- B. Accessories: Install necessary components that are required for complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.
- C. Install roofing felt and building paper slip sheet on roof sheathing before installing preformed metal roof panels; secure by methods acceptable to roof panel manufacturer, minimizing use of metal fasteners; apply from eaves to ridge in shingle fashion, overlapping horizontal joints at least 2 inches (50 mm) and side and end laps at least 3 inches (75 mm); offset seams in building paper and seams in roofing felt.
- D. Roof Panels: Install metal roof panels in accordance with manufacturer's installation instructions, minimizing transverse joints except at junction with penetrations.
1. Install sealant or sealant tape at end laps and side joints as recommended by metal roof panel manufacturer.

3.04 CLEANING

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

3.05 PROTECTION

- A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.
- B. Touch-up, repair, or replace damaged roof panels or accessories before Date of Substantial Completion.

END OF SECTION

SECTION 074213 METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured metal panels for exterior wall panels, interior liner panels, soffit panels, retrofit panels, and subgirt framing assembly, with insulation, related flashings, and accessory components.

1.02 RELATED REQUIREMENTS

- A. Section 054000 - Cold-Formed Metal Framing: Wall panel substrate.
- B. Section 072100 - Thermal Insulation.
- C. Section 072500 - Weather Barriers: Weather barrier under wall panels.
- D. Section 072600 - Vapor Retarders: Vapor retarder under wall panels.
- E. Section 072700 - Air Barriers: Air barrier under wall panels.
- F. Section 079200 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.

1.03 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum; 2025.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
 - 1. Physical characteristics of components shown on shop drawings.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions and recommendations.
- C. Shop Drawings: Indicate dimensions, layout, joints, construction details, support clips, _____, and methods of anchorage.
- D. Manufacturer's qualification statement.
- E. Installer's qualification statement.
- F. Warranty Documentation for Installation of Building Rainscreen Assembly: Submit installer warranty and ensure that forms have been completed in Owner's name and registered with installer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in installing products specified in this section with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

- C. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.
- D. Prevent contact with materials that may cause discoloration or staining of products.

1.07 FIELD CONDITIONS

- A. Do not install wall panels when air temperature or relative humidity are outside manufacturer's limits.

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Wall Panels - Exposed Fasteners:
 - 1. Englert, Inc; 1.25 Inch Uniline R: www.englertinc.com/#sle.
 - 2. Substitutions: See Section 016000 - Product Requirements.
- B. Metal Wall Panels - Concealed Fasteners:
 - 1. Arconic Architectural Products LLC; REYNOCLAD 1mm Aluminum Sheet: www.arconic.com/#sle.
 - 2. ATAS International, Inc; Multi-Purpose Panels ____: www.atas.com/#sle.
 - 3. Berridge Manufacturing Company; BR-12 Panel: www.berridge.com/#sle.
 - 4. Englert, Inc; B4000: www.englertinc.com/#sle.
 - 5. McElroy Metal; ____: www.mcelroymetal.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.
- C. Metal Soffit Panels:
 - 1. ATAS International, Inc; Wind-Lok Soffit MPS 120: www.atas.com/#sle.
 - 2. Englert, Inc; B4000: www.englertinc.com/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.

2.02 METAL WALL PANEL SYSTEM

- A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
 - 1. Provide exterior wall panels, interior liner panels, soffit panels, retrofit wall panels, and subgirt framing assembly.
 - 2. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
 - 3. Design Pressure: In accordance with applicable codes.
 - 4. Maximum Allowable Deflection of Panel: L/180 for length(L) of span.
 - 5. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
 - 6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
 - 7. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
 - 8. Corners: Factory-fabricated in one continuous piece with minimum 2-inch (51 mm) returns.
 - 9. Provide continuity of weather barrier seal at building enclosure elements in accordance with requirements; see Section 072500.
 - 10. Provide continuity of vapor retarder seal at building enclosure elements in accordance with requirements; see Section 072600.
 - 11. Provide continuity of air barrier seal at building enclosure elements in accordance with requirements; see Section 072700.
- B. Exterior Wall Panels:

1. Profile: Vertical; style as indicated.
 2. Side Seams: Double-interlocked, tight-fitting, sealed with continuous gaskets.
 3. Material: Precoated aluminum sheet, 20 gauge, 0.032 inch (0.81 mm) minimum thickness.
 4. Panel Width: ____ inches (____ mm).
- C. Interior Liner Panels:
1. Profile: Vertical; style as indicated.
 2. Side Seams: Interlocking, sealed with continuous bead of sealant.
 3. Panel Width: ____ inch (____ mm).
- D. Soffit Panels:
1. Profile: Style as indicated, with venting provided.
- E. Retrofit Wall Panels:
1. Profile: Vertical; style as indicated.
 2. Side Seams: Lapped.
 3. Condensation Control: Factory-applied membrane to reduce drips resulting from backside condensation.
 4. Panel Width: ____ inches (____ mm).
- F. Subgirt Framing Assembly:
- G. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.
- H. Expansion Joints: Same material, thickness and finish as exterior sheets; ____ gauge, ____ inch (____ mm) thick; manufacturer's standard brake formed type, of profile to suit system.
- I. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- J. Anchors: Galvanized steel.

2.03 FINISHES

- A. Exposed Surface Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over epoxy primer.
- B. Panel Backside Finish: Panel manufacturer's standard siliconized polyester wash coat.
- C. High Performance Organic Coating System: Multi-coat, high-durable polyester system; color as indicated on drawings.
1. Systems:
 - a. Two-coat in accordance with AAMA 2604.

2.04 ACCESSORIES

- A. Support for Cladding and Continuous Insulation: Thermal clips.
1. Thermally-broken clips that provide attachment support for girts, angles, channels, and other cladding support framing.
 2. Fasteners: As recommended by clip manufacturer.
 3. Products:
 - a. Carter Architectural Panels, Inc; KOA Thermal Clip: www.carterpanels.com/#sle.
 - b. Cascadia Windows & Doors; Cascadia Clip: www.cascadiawindows.com/#sle.
 - c. Northern Facades; ISO Clip: www.northernfacades.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- B. Support for Cladding and Continuous Insulation: Continuous thermal Z-girts.
1. Fiberglass reinforced plastic (FRP) girts that provide cladding attachment support for exterior wall cladding, brick veneer, CMU veneer, metal wall panels, siding, and ____.
 2. Fasteners: As recommended by clip manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that building framing members are ready to receive panels.
- B. Verify weather barrier, see Section 072500, has been installed over wall panel substrate; see Section 054000.
- C. Verify air barrier, see Section 072700, has been installed over wall panel substrate; see Section 054000.

3.02 PREPARATION

- A. Install subgirts perpendicular to panel length, securely fastened to substrates and shimmed and leveled to uniform plane, and spaced at intervals indicated.
- B. Protect surrounding areas and adjacent surfaces from damage during execution of this work.

3.03 INSTALLATION

- A. Install panels on walls and soffits in accordance with manufacturer's instructions.
- B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint; allow to dry prior to wall panel installation.
- C. Fasten panels to structural supports; aligned, level, and plumb.
- D. Provide expansion and control joints where indicated.
- E. Use concealed fasteners unless otherwise indicated by Architect.

3.04 CLEANING

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Remove site cuttings from finish surfaces.
- C. Remove protective material from wall panel surfaces.
- D. Upon completion of installation, thoroughly clean prefinished aluminum surfaces in accordance with AAMA 609 & 610.

3.05 PROTECTION

- A. Protect metal wall panels until completion of project.
- B. Touch-up, repair, or replace damaged wall panels or accessories before Date of Substantial Completion.

END OF SECTION

SECTION 076200 SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, exterior penetrations, and other items indicated in Schedule.
- B. Sealants for joints within sheet metal fabrications.
- C. Precast concrete splash pads.

1.02 RELATED REQUIREMENTS

- A. Section 077123 - Manufactured Gutters and Downspouts.

1.03 REFERENCE STANDARDS

- A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- D. ASTM A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products; 2018.
- E. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- F. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- G. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).
- H. CDA A4050 - Copper in Architecture - Handbook; Current Edition.
- I. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sheet Metal Flashing and Trim:
 - 1. ALUCOBOND by 3A Composites USA; ALUCOBOND AXCENT:
www.alucobondusa.com/#sle.

2. Substitutions: See Section 016000 - Product Requirements.

B. Exterior Penetration Flashing Panel:

2.02 SHEET MATERIALS

- A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24-gauge, 0.0239-inch (0.61 mm) thick base metal.
- B. Anodized Aluminum: ASTM B209/B209M, 3005 alloy, H12 or H14 temper; 0.032 inch (0.81 mm) thick; clear anodized finish.
 1. Clear Anodized Finish: AAMA 611, AA-M12C22A41, Class I, clear anodic coating not less than 0.7 mil, 0.0007 inch (0.018 mm) thick.

2.03 PREFINISHED ALUMINUM SHEETS

- A. Aluminum Sheet Substrates: ASTM B209/B209M, alloy and temper as recommended by manufacturer for application.

2.04 PREPAINTED, METALLIC-COATED STEEL SHEETS

- A. Description: Factory-applied coatings applied to metallic-coated steel sheet substrates prior to fabrication by coil coating; topcoat systems consist of primers and organic topcoats on exposed, top side of sheet; washcoats on bottom, unexposed sheet side.
- B. Comply with ASTM A755/A755M.
- C. Metallic-Coated Steel Sheet Substrates:
- D. Substrate Preparation for Prefinishing: Clean and prepare substrate surfaces in accordance with coating manufacturer's recommendations for substrate type and application.
- E. Washcoats or Backercoats: Provide washcoats or backercoats in accordance with organic coating manufacturer's recommendations.
- F. Primer Coats: Provide basecoat primers in accordance with coating manufacturer's recommendations for substrate type, topcoat, and application.
- G. High-Performance Organic Coating System: Provide thermally cured, 50-percent PVDF or silicone-modified polyester systems in accordance with AAMA 2604; tested for weathering for 5 years with 5 delta units maximum of color change.

2.05 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18-inch (450 mm) long legs; seam for rigidity, seal with sealant.
- F. Fabricate flashings to allow toe to extend 2 inches (50 mm) over roofing gravel. Return and brake edges.

2.06 GUTTERS AND DOWNSPOUTS

- A. See Section 077123 for manufactured gutters and downspouts.
- B. Gutters: SMACNA (ASMM) Rectangular profile.
- C. Downspouts: Rectangular profile.
- D. Gutters and Downspouts: Size indicated on drawings.
- E. Accessories: Profiled to suit gutters and downspouts.
 1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
 2. Gutter Supports: Brackets.

- 3. Downspout Supports: Brackets.
- F. Splash Pads: Precast concrete type, of size and profiles indicated; minimum 3,000 psi (21 MPa) at 28 days, with minimum 5 percent air entrainment.
- G. Downspout Extenders: Same material and finish as downspouts.
- H. Seal metal joints.

2.07 FLASHING

- A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

2.08 ACCESSORIES

- A. Fasteners: Galvanized steel, with soft neoprene washers.
- B. Primer Type: Zinc chromate.
- C. Concealed Sealants: Non-curing butyl sealant.
- D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
 - 1. Products:
 - a. Franklin International, Inc; Titebond WeatherMaster Metal Roof Sealant: www.titebond.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- E. Fenestration Perimeter Flashing Attachments: Two-piece flashing receiver and clip of extruded aluminum, at least 0.045 inch (1.14 mm) thick, for attaching flashing at perimeter of exterior wall fenestration openings.
 - 1. Provide flashing receiver profile appropriate for flashing applications.
 - 2. Products:
- F. Asphalt Roof Cement: ASTM D4586/D4586M, Type I, asbestos-free.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.
- C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch (0.38 mm).

3.03 INSTALLATION

- A. Insert flashings into reglets to form tight fit; secure in place with lead wedges; pack remaining spaces with lead wool; seal flashings into reglets with sealant.
- B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.
- C. Apply plastic cement compound between metal flashings and felt flashings.
- D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- E. Exterior Flashing Receivers: Install in accordance with manufacturer's recommendations, and in proper relationship with adjacent construction, and as follows:
 - 1. Secure receiver at perimeter of wall opening with adhesives or fasteners.

2. Place flashing into receiver channel.
 3. Secure flashing with receiver clip.
- F. Seal metal joints watertight.
- G. Secure gutters and downspouts in place with concealed fasteners.
- H. Set splash pads under downspouts, and set in place with _____.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.05 SCHEDULE

- A. Through-Wall Flashing in Masonry:
1. Drawing Detail: SMACNA (ASMM), _____.
- B. Gutters and Downspouts:
- C. Sheet Metal Roof Expansion Joint Covers, and Roof-to-Wall Joint Covers:
- D. Roofing Penetration Flashings, for Pipes, Structural Steel, and Equipment Supports:

END OF SECTION

SECTION 077200 ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Roof ventilation louvers.
- B. Ridge vents.
- C. Eave vents.

1.02 RELATED REQUIREMENTS

- A. Section 077100 - Roof Specialties: Other manufactured roof specialty items.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance requirements.
- C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
- D. Warranty Documentation:
 - 1. Submit manufacturer warranty.
 - 2. Ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for _____. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. See Section 077100 for information on roof specialties.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Clean installed work to like-new condition.

3.05 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 079513 EXPANSION JOINT COVER ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Expansion joint cover assemblies for floor, wall, ceiling, and soffit surfaces.

1.02 RELATED REQUIREMENTS

- A. Section 042000 - Unit Masonry: Placement of joint cover assembly frames in masonry.
- B. Section 042723 - Cavity Wall Unit Masonry: Placement of joint cover assembly frames in masonry.
- C. Section 076200 - Sheet Metal Flashing and Trim: Roof expansion and control joint covers.
- D. Section 092116 - Gypsum Board Assemblies: Placement of expansion joint assemblies in gypsum board walls and ceilings.
- E. Section 095100 - Acoustical Ceilings: Expansion joint assemblies in suspended ceiling grids.

1.03 REFERENCE STANDARDS

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- C. ASTM B308/B308M - Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles; 2020.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate joint and splice locations, miters, layout of the work, affected adjacent construction, anchorage locations, and ____.
- C. Manufacturer's Installation Instructions: Indicate rough-in sizes and required tolerances for item placement.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Expansion Joint Cover Assemblies:
 - 1. Balco, Inc; ____: www.balcousa.com/#sle.
 - 2. Construction Specialties, Inc; ____: www.c-sgroup.com/#sle.
 - 3. EMSEAL Joint Systems, Ltd; ____: www.emseal.com/#sle.
 - 4. Inpro; ____: www.inprocorp.com/#sle.
 - 5. Substitutions: See Section 016000 - Product Requirements.

2.02 EXPANSION JOINT COVER ASSEMBLY APPLICATIONS

- A. Interior Wall/Ceiling Joints Subject to Thermal Movement:
 - 1. Manufacturers:
 - a. Construction Specialties, Inc; Allway Standard Wall and Ceiling Covers: www.c-sgroup.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- B. Interior Non-Fire-Rated Wall/Ceiling Joints Subject to Seismic Movement:
 - 1. Manufacturers:
 - a. Balco, Inc; CM Wall Expansion Joint Cover: www.balcousa.com/#sle.
 - b. Construction Specialties, Inc; Flush Seismic Wall and Ceiling Covers: www.c-sgroup.com/#sle.
- C. Exterior Wall Joints Subject to Thermal Movement:

1. Manufacturers:
 - a. Balco, Inc; Exterior Wall, Elastomeric Face Seal System (FCWW): www.balcousa.com/#sle.
 - b. Construction Specialties, Inc; Exterior Wall Covers: www.c-sgroup.com/#sle.
 - c. EMSEAL Joint Systems, Ltd; BG System: www.emseal.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- D. Exterior Wall Joints Subject to Seismic Movement:
 1. Manufacturers:
 - a. Balco, Inc; CMX Wall Cover: www.balcousa.com/#sle.
 - b. _____.
 - c. Substitutions: See Section 016000 - Product Requirements.
- E. Exterior Roof Bellows with Metal Flange Expansion Joint Covers:
 1. Manufacturers:
 - a. Balco, Inc; Roof Bellows, Aluminum Flanges (BRBA): www.balcousa.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- F. Exterior Roof Expansion Joint Covers:
 1. Manufacturers:
 - a. Balco, Inc; Eclipse TRX Roof Expansion Joint Cover: www.balcousa.com/#sle.
 - b. SITURA Inc; _____: www.situra.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.

2.03 EXPANSION JOINT COVER ASSEMBLIES

- A. Expansion Joint Cover Assemblies - General: Factory-fabricated and assembled; designed to completely fill joint openings, sealed to prevent passage of air, dust, water, smoke; suitable for traffic expected.
 1. Joint Dimensions and Configurations: As indicated on drawings.
 2. Joint Cover Sizes: Selected to suit joint width and configuration, based on manufacturer's published recommendations and limitations.
 3. Joint Cover Styles: As indicated on drawings.
 4. Joint Movement Capability: If not indicated, provide minimum plus/minus 25 percent joint movement capability.
 5. Lengths: Provide covers in full lengths required; avoid splicing wherever possible.
 6. Anchors, Fasteners, and Fittings: Provided by cover manufacturer.

2.04 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper; or ASTM B308/B308M, 6061 alloy, T6 temper.
- B. Anchors and Fasteners: As recommended by cover manufacturer.
- C. Ferrous Metal Anchors: Galvanized where embedded in concrete or in contact with cementitious materials.
- D. Threaded Fasteners: Aluminum.
- E. Backing Paint for Aluminum Components in Contact with Cementitious Materials: Asphaltic type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joint preparation and dimensions are acceptable and in accordance with manufacturer's requirements.
- B. Verify that frames and anchors installed by others are in correct locations and suitable for installation of remainder of assembly.

3.02 INSTALLATION

- A. Install components and accessories in accordance with manufacturer's instructions.
- B. Align work plumb and level, flush with adjacent surfaces.
- C. Rigidly anchor to substrate to prevent misalignment.

3.03 PROTECTION

- A. Do not permit traffic over unprotected floor joint surfaces.
- B. Provide strippable coating to protect finish surface.

END OF SECTION

SECTION 081113 HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
- C. Fire-rated hollow metal doors and frames.
- D. Thermally insulated hollow metal doors with frames.
- E. Sound-rated hollow metal doors and frames.
- F. Commercial security hollow metal doors and frames.
- G. Detention security hollow metal doors and frames.
- H. Bullet-resistant hollow metal doors and frames.
- I. Blast-resistant hollow metal doors and frames.
- J. Hurricane-resistant hollow metal doors and frames.
- K. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS

- A. Section 081119 - Stainless-Steel Doors and Frames.
- B. Section 083473 - Sound Control Door Assemblies.
- C. Section 087100 - Door Hardware.
- D. Section 088000 - Glazing: Glass for doors and borrowed lites.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames; 2025.
- C. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2024.
- D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.
- E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2025.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2024.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
- I. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- J. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
- K. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- L. ASTM F2927 - Standard Test Method for Door Systems Subject to Airblast Loadings; 2021.

- M. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
- N. FBC TAS 201 - Impact Test Procedures; Testing Application Standard; 1994.
- O. FBC TAS 202 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure; Testing Application Standard; 1994.
- P. FBC TAS 203 - Criteria for Testing Products Subject To Cyclic Wind Pressure Loading; Testing Application Standard; 1994.
- Q. FEMA P-361 - Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms; 2024.
- R. FLA (PAD) - Florida Building Code Online - Product Approval Directory; Current Edition.
- S. ICC 500 - ICC/NSSA Standard for the Design and Construction of Storm Shelters; 2020.
- T. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- U. ITS (DIR) - Directory of Listed Products; Current Edition.
- V. Miami (APD) - Approved Products Directory; Miami-Dade County; Current Edition.
- W. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- X. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.
- Y. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.
- Z. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- AA. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.
- BB. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- CC. UL (DIR) - Online Certifications Directory; Current Edition.
- DD. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- EE. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.
- FF. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Design Submittals: Manufacturer to submit anchor design analysis calculations for blast-resistant doors signed and sealed by specialty design engineer experienced in this type of work and licensed in the State in which the Project is located.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: <https://steeldoor.org/sdi-certified/#sle>.
- B. Maintain at project site copies of reference standards relating to installation of products specified.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Doors and Frames:

1. Ceco Door, an Assa Abloy Group company; ____: www.assaabloydss.com/#sle.
 2. Krieger Specialty Products; ____: www.kriegerproducts.com/#sle.
 3. Premier Steel Doors and Frames: www.trustpremier.com/#sle.
 4. Steelcraft, an Allegion brand; ____: www.allegion.com/#sle.
 5. Substitutions: See Section 016000 - Product Requirements.
- B. Sound-Rated Hollow Metal Doors and Frames:
1. AMBICO Limited; ____: www.ambico.com/#sle.
 2. De La Fontaine; STC - Acoustical Core: www.delafontaine.com/#sle.
 3. Substitutions: See Section 016000 - Product Requirements.
- C. Hurricane-Resistant and Tornado-Resistant Hollow Metal Doors and Frames:
1. Krieger Specialty Products; ____: www.kriegerproducts.com/#sle.
 2. Premier Steel Doors and Frames: www.trustpremier.com/#sle.
 3. Republic Doors, an Allegion brand; ____: www.republicdoor.com/#sle.
 4. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
 4. Door Edge Profile: Manufacturers standard for application indicated.
 5. Typical Door Face Sheets: Flush.
 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvanized) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
 - a. Based on SDI Standards: Provide at least A40/ZF120 (galvanized) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvanized) for corrosive locations.
- B. Hollow Metal Panels: Same construction, performance, and finish as doors.
- C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Exterior Doors: Thermally insulated.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 1 - Standard-duty.
 - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.

2. Door Core Material: Vertical steel stiffeners with fiberglass batts.
 3. Door Thermal Resistance: R-Value of ____.
 4. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
 5. Weatherstripping: Refer to Section 087100.
- C. Type ____, Interior Doors, Non-Fire-Rated:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 1 - Standard-duty.
 - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 3. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
- D. Type ____, Fire-Rated Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 1 - Standard-duty.
 - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
 3. Temperature-Rise Rating (TRR) Across Door Thickness: In accordance with local building code and authorities having jurisdiction.
 4. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - a. Attach fire rating label to each fire rated unit.
 5. Smoke and Draft Control Doors (Indicated with letter "S" on Drawings and/or Door Schedule): Self-closing or automatic closing doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;
 - a. Maximum Air Leakage: 3.0 cfm/sq ft (0.02 cu m/sec/sq m) of door opening at 0.10 inch w.g. (24.9 Pa) pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
 - b. Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.
 - c. Label: Include the "S" label on fire-rating label of door.
 6. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
- E. Type ____, Sound-Rated Interior Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 1 - Standard-duty.
 - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 2. Sound Transmission Class (STC) Rating of Door and Frame Assembly: STC of 39, minimum, calculated in accordance with ASTM E413, and tested in accordance with ASTM E90.
 3. Door Core Material: Manufacturer's standard construction as required to meet acoustic requirements indicated.
 4. Door Thickness: As required to meet acoustic requirements indicated.
 5. Sound Seals: Integral, in door and/or frame.

6. Opening Force of Sound-Rated Doors, Non-Fire-Rated: 5 pounds (22.2 N), maximum, in compliance with ADA Standards.
- F. Type ____, Commercial Security, Detention Security, and Bullet-Resistant Doors; Interior and Exterior:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 1 - Standard-duty.
 - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 2. Bullet Resistance: UL 752, Threat Level Rating - Level 1.
 3. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
 4. Door Thickness: As required to meet requirements indicated.
 5. Hinge Rail and Reinforcement: Non-beveled edge, reinforced with continuous steel channel, 12 gauge, 0.093 inch (2.3 mm) minimum metal thickness, welded at 5 inch (127 mm) on center maximum, and compatible with 4-1/2 inch (114 mm) full mortise template and continuous geared hinges.
- G. Type ____, Blast-Resistant Exterior Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 1 - Standard-duty.
 - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 2. Blast Resistance (Dynamic Loading): Provide doors capable of withstanding explosive pressure, in compliance with ASTM F2927, having response damage of Category V.
 3. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements..
 4. Door Thickness: As required to meet requirements indicated.
 5. Door Face Sheets: Flush.
 6. Door Finish: Factory primed and field finished.
 7. Hinge Rail and Reinforcement: Non-beveled edge, reinforced with continuous steel channel, 12 gauge, 0.093 inch (2.3 mm) minimum metal thickness, welded at 5 inch (127 mm) on center maximum, and compatible with 4-1/2 inch (114 mm) full mortise template and continuous geared hinges.
- H. Type ____, Hurricane-Resistant Doors:
1. Comply with Florida Building Code (FBC) test protocols for High Velocity Hurricane Zone (HVHZ) FBC TAS 201, FBC TAS 202 and FBC TAS 203.
 2. Design and size door and frame components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M.
 - a. Design Wind Loads: Comply with requirements of authorities having jurisdiction.
 - b. Wind-Borne Debris Resistance: Door and frame components shall have FLA (PAD) approval or Miami (APD) approval for Large and Small Missile impact and pressure cycling at design wind loads.
 3. Hurricane Shelter Application: Comply with ICC 500 standard.
 - a. Commercial: Designed and tested to comply with FEMA P-361 community shelter door assembly guidelines.
 4. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 3 - Extra Heavy-duty.
 - b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.

- d. Door Face Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum.
- 5. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
- 6. Door Thickness: 1-3/4 inches (44.5 mm), nominal.

2.04 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Exterior Door Frames: Knock-down type.
 - 1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
 - 2. Frame Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
 - 3. Frame Finish: Factory primed and field finished.
 - 4. Weatherstripping: Separate, see Section 087100.
- C. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
 - 1. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch (150 mm), maximum, above floor at 45 degree angle.
 - 2. Frame Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
 - 3. Frame Finish: Factory primed and field finished.
- D. Door Frames, Fire-Rated: Knock-down type.
 - 1. Fire Rating: Same as door, labeled.
 - 2. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch (150 mm), maximum, above floor at 45 degree angle.
 - 3. Frame Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
 - 4. Frame Finish: Factory primed and field finished.
- E. Sound-Rated Door Frames: Knock-down type.
 - 1. Frame Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
 - 2. Frame Finish: Factory primed and field finished.
- F. Bullet-Resistant Door Frames: Comply with UL 752, with same level of bullet resistance as door; face welded construction, ground smooth, fully prepared and reinforced for hardware installation.
- G. Commercial and/or Detention Security-Resistant Door Frames: With same security resistance as door; face welded or full profile/continuously welded construction, ground smooth, fully prepared and reinforced for hardware installation.
- H. Blast-Resistant Door Frames: With same blast resistance as door; face welded or full profile/continuously welded construction, ground smooth, fully prepared and reinforced for hardware installation.
- I. Hurricane-Resistant Door Frames: With same hurricane resistance as door; face welded or full profile/continuously welded construction, ground smooth, fully prepared and reinforced for hardware installation.
 - 1. Frame Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum.
 - 2. Frame Finish: Factory primed and field finished.
- J. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.
- K. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

2.05 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Factory Finish: Complying with ANSI/SDI A250.3, manufacturer's standard coating.
 - 1. Color: As selected by Architect from manufacturer's standard range.

2.06 ACCESSORIES

- A. Louvers: Roll formed steel with overlapping frame; finish same as door components ; factory-installed.
 - 1. In Fire-Rated Doors: UL (DIR) or ITS (DIR) listed fusible link louver, same rating as door.
 - 2. Louver Free Area: SEE MECHANICAL DRAWINGS percent.
 - 3. Fasteners: Exposed or concealed fasteners.
- B. Door Window Frames: Door window frames with glazing securely fastened within door opening.
 - 1. Frame Material: 18 gauge, 0.0478 inch (1.21 mm), galvanized steel.
 - 2. Manufacturers:
 - a. Substitutions: See Section 016000 - Product Requirements.
- C. Glazing: As specified in Section 088000, factory installed.
- D. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- E. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
- F. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install prefinished frames after painting and wall finishes are complete.
- C. Install fire rated units in accordance with NFPA 80.
- D. Coordinate frame anchor placement with wall construction.
- E. Install door hardware as specified in Section 087100.
- F. Comply with glazing installation requirements of Section 088000.
- G. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch up damaged factory finishes.

3.04 ADJUSTING

- A. Adjust for smooth and balanced door movement.
- B. Adjust sound control doors so that seals are fully engaged when door is closed.
- C. Test sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

3.05 SCHEDULE - SEE DRAWINGS

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 081416 FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flush wood doors; flush and flush glazed configuration; fire-rated, non-rated, acoustical, special function, and _____.
- B. Transom panels.

1.02 RELATED REQUIREMENTS

- A. Section 062000 - Finish Carpentry: Wood door frames.
- B. Section 081113 - Hollow Metal Doors and Frames.
- C. Section 081213 - Hollow Metal Frames.
- D. Section 087100 - Door Hardware.
- E. Section 088000 - Glazing.
- F. Section 099123 - Interior Painting: Field finishing of doors.
- G. Section 099300 - Staining and Transparent Finishing: Field finishing of doors.

1.03 REFERENCE STANDARDS

- A. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).
- B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- C. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2023, with Editorial Revision.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- E. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2023.
- F. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- G. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- H. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- I. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.
- J. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
 - 1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
 - 2. Include certification program label.
- D. Samples: Submit two samples of door veneer, ____ by ____ inches (____ by ____ mm) in size illustrating wood grain, stain color, and sheen.
- E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

- F. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
1. Company with at least one project within past five years with value of woodwork within at least 20 percent of cost of woodwork for this project.
 2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer's warranty on interior doors for the life of the installation. Complete forms in Owner's name and register with manufacturer.
1. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Veneer Faced Doors:
1. Haley Brothers: www.haleybros.com/#sle.
 2. Horton Automatics, a division of Overhead Door Corporation; FlexBarn: www.overheaddoor.com/#sle.
 3. Krieger Specialty Products: www.kriegerproducts.com/#sle.
 4. Forte Opening Solutions; Aspiro Select Wood Veneer Doors: www.forteopenings.com/#sle.
 5. Substitutions: See Section 016000 - Product Requirements.
- B. High Pressure Decorative Laminate (HPDL) Faced Doors:
1. Eliason Corporation, a Division of Senneca Holdings; StyleCraft: www.eliasoncorp.com/#sle.
 2. Forte Opening Solutions; Aspiro Choice Laminate Doors: www.forteopenings.com/#sle.
 3. Oregon Door: www.oregondoor.com/#sle.
 4. Substitutions: See Section 016000 - Product Requirements.
- C. Low Pressure Decorative Laminate (LPDL) Faced Doors:
- D. Sound-Rated Wood Doors:
1. Forte Opening Solutions; Acoustically-Rated Door Solutions: www.forteopenings.com/#sle.
 2. Substitutions: See Section 016000 - Product Requirements.

2.02 DOORS AND PANELS

- A. Doors: See drawings for locations and additional requirements.
1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

3. High Pressure Decorative Laminate (HPDL) Faced Doors: 5-ply unless otherwise indicated.
 4. Acrylic-Modified Vinyl Faced Doors:
- B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.
1. Provide solid core doors at each location.
 2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
 3. Wood veneer facing for field transparent finish as indicated on drawings.
 4. Wood veneer facing for field opaque finish as indicated on drawings.
 5. High pressure decorative laminate (HPDL) finish as indicated on drawings.
 6. Hardboard facing with factory opaque finish as indicated on drawings.
- C. Transom Panels: Same construction and finish as door; same performance rating as door.

2.03 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.
- B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
- C. Sound-Rated Doors: Equivalent to type, with particleboard core (PC) construction as required to achieve STC rating specified; plies and faces as indicated above.
- D. Hollow Core Doors: Type - Standard (FSHC); plies and faces as indicated above.

2.04 DOOR FACINGS

- A. Veneer Facing for Transparent Finish: Red oak, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
1. Transoms: Continuous match to doors.
- B. Veneer Facing for Opaque Finish: Medium density overlay (MDO), in compliance with indicated quality standard.
- C. Hardboard Facing for Opaque Finish: ANSI A135.4, Class 1 - Tempered, S2S (smooth two sides) hardboard, 1/8 inch (3.2 mm) thick.
- D. Acrylic-Modified PVC Facing: Manufacturer's standard formulation.
1. Thickness: 0.040 inch (1.02 mm).
 2. Color and Pattern: As selected from manufacturer's standard finishes.
 3. Texture: As selected from manufacturer's standard textures.
 4. Mounting: Adhesive.
 5. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 55 or less, when tested in accordance with ASTM E84.
 6. Impact Strength: 18 ft lbf/in (960.8 J/m) minimum, when tested in accordance with ASTM D256.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
- C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
 - 1. Exception: Doors to be field finished.
- F. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

- A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent:
 - a. System - 1, Lacquer, Nitrocellulose.
 - b. Sheen: Flat.
 - 2. Opaque:
 - a. System - 1, Lacquer, Nitrocellulose.
 - b. Color: As selected by Architect.
 - c. Sheen: Flat.
- B. Factory finish doors in accordance with approved sample.

2.07 ACCESSORIES

- A. Wood Door Frames: See Section 062000.
- B. Hollow Metal Door Frames: See Section 081113.
- C. Metal Louvers: See Section 08 1113.
- D. Glazed Openings:
 - 1. Heat-Strengthened and Fully Tempered Glass: ASTM C1048.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
 - 1. Install fire-rated doors in accordance with NFPA 80 requirements.
 - 2. Install smoke and draft control doors in accordance with NFPA 105 requirements.
 - 3. Install exterior doors in accordance with ASTM E2112.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Use machine tools to cut or drill for hardware.
- D. Coordinate installation of doors with installation of frames and hardware.

3.03 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

3.05 SCHEDULE

- A. See Door and Frame Schedule appended to this section.

END OF SECTION

SECTION 083323 OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Interior non-fire-rated coiling doors.

1.02 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- D. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.
- E. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide general construction, electrical equipment, and component connections and details.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

1.04 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Overhead Coiling Metal Doors:
 - 1. Alpine Overhead Doors, Inc; Wind-Tite - Warehouse Door: www.alpinedoors.com/#sle.
 - 2. Overhead Door Corporation; Model 610 Rolling Service Door: www.overheaddoor.com/#sle.
 - 3. Wayne-Dalton, a Division of Overhead Door Corporation; Model 900 Rolling Service Door: www.wayne-dalton.com/#sle.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Lightweight Overhead Coiling Metal Doors:
 - 1. ASTA America by Janus International; 190 Series Economy Commercial Sheet Door: www.astaamerica.com/#sle.
 - 2. Substitutions: See Section 016000 - Product Requirements.

2.02 COILING DOORS

- A. Interior Non-Fire-Rated Coiling Doors: Steel slat curtain.
 - 1. Single Thickness Slats: Manufacturer's standard.
 - 2. Vent Slats: Manufacturer's standard, in locations indicated on drawings.
 - 3. Finish: Primed.
 - 4. Locking Devices: Slide bolt on inside.

2.03 MATERIALS

- A. Metal Curtain Construction: Interlocking slats.
 - 1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.

2. Curtain Bottom for Slat Curtains: Fitted with angles to provide reinforcement and positive contact in closed position.
 3. Weatherstripping for Exterior Doors: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.
 4. Smoke Seals: Provide brush or gasket type weatherstripping seals to prevent passage of smoke and hot gases in compliance with UL 1784 testing requirements.
 5. Steel Slats: Minimum thickness, ____ gauge, ____ inch (____ mm); ASTM A653/A653M galvanized steel sheet.
- B. Guide Construction: Continuous, of profile to retain door in place with snap-on trim, mounting brackets of same metal.
- C. Lock Hardware:
1. Cylindrical Locking Mechanism: Latchset lock cylinder, specified in Section 087100.
 2. Latch Handle: Manufacturer's standard.
 3. Slide Bolt: Provide on single-jamb side, extending into slot in guides, with padlock on one side.
- D. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb (10 kg) nominal force to operate.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install smoke door assemblies in accordance with NFPA 105.
- C. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- D. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- E. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

3.02 TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch (1.6 mm).
- C. Maximum Variation From Level: 1/16 inch (1.6 mm).
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 feet (3.2 mm per 3 m) straight edge.

3.03 ADJUSTING

- A. Adjust operating assemblies for smooth and noiseless operation.

3.04 CLEANING

- A. Clean installed components.
- B. Remove labels and visible markings.

END OF SECTION

SECTION 087100 DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hardware for wood, aluminum, hollow metal, and _____ doors.
- B. Hardware for fire-rated doors.
- C. Lock cylinders for doors that hardware is specified in other sections.
- D. Thresholds.
- E. Weatherstripping and gasketing.

1.02 RELATED REQUIREMENTS

- A. Section 081113 - Hollow Metal Doors and Frames.
- B. Section 081116 - Aluminum Doors and Frames.
- C. Section 081416 - Flush Wood Doors.
- D. Section 081423 - Clad Wood Doors.
- E. Section 084313 - Aluminum-Framed Storefronts: Door hardware, except as noted in section.
- F. Section 084413 - Glazed Aluminum Curtain Walls: Door hardware, except cylinders.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. BHMA (CPD) - Certified Products Directory; Current Edition.
- C. BHMA A156.4 - Door Closers and Pivots; 2024.
- D. BHMA A156.6 - Standard for Architectural Door Trim; 2021.
- E. BHMA A156.8 - Door Controls - Overhead Stops and Holders; 2021.
- F. BHMA A156.16 - Standard for Auxiliary Hardware; 2023.
- G. BHMA A156.20 - Standard for Strap and Tee Hinges, and Hasps; 2021.
- H. BHMA A156.21 - Thresholds; 2025.
- I. BHMA A156.22 - Standard for Gasketing; 2021.
- J. BHMA A156.23 - Electromagnetic Locks; 2022.
- K. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
- L. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames; 2006.
- M. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; 2004.
- N. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.
- O. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- P. ITS (DIR) - Directory of Listed Products; Current Edition.
- Q. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- R. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- S. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.
- T. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- U. UL (DIR) - Online Certifications Directory; Current Edition.

- V. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- W. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.
- C. Provide door hardware products that comply with the following requirements:
 - 1. Applicable provisions of federal, state, and local codes.
 - 2. Accessibility: ADA Standards and ICC A117.1.
 - 3. Applicable provisions of NFPA 101.
 - 4. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
 - 5. Hardware on Fire-Rated Doors: Listed and classified by as suitable for application indicated.
 - 6. Hardware for Smoke and Draft Control Doors. Provide door hardware that complies with local codes, and requirements of assemblies tested in accordance with UL 1784.
 - 7. Listed and certified compliant with specified standards by BHMA (CPD).
 - 8. Straps and Tee Hinges: BHMA A156.20.
 - 9. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
 - 10. Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.
- D. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's series. See Door Hardware Schedule.

2.02 ELECTROMAGNETIC LOCKS

- A. Manufacturers:
 - 1. Substitutions: See Section 016000 - Product Requirements.
- B. Electromagnetic Locks: Comply with BHMA A156.23, Grade 1.
 - 1. Holding Force: 300 lbs (136 kg), minimum.
 - 2. Voltage: 12 VDC, and provide power supplies by same manufacturer as locks.
 - 3. Mounting: Surface mounted to door and frame on secure side, with fasteners, brackets, and spacer bars as required for application.

2.03 DOOR PULLS AND PUSH PLATES

- A. Manufacturers:
 - 1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Forms+Surfaces: www.forms-surfaces.com/#sle.
 - 3. Hager Companies: www.hagerco.com/#sle.
 - 4. Hiawatha, Inc, division of Activar Construction Products Group, Inc: www.activarcpg.com/hiawatha/#sle.
 - 5. Pamex, Inc; Door Pulls and Push Plates: www.pamexinc.com/#sle.
 - 6. Trimco: www.trimcohardware.com/#sle.
 - 7. Substitutions: See Section 016000 - Product Requirements.
- B. Door Pulls and Push Plates: Comply with BHMA A156.6.
 - 1. Pull Type: Straight, unless otherwise indicated.
 - 2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
 - a. Edges: Beveled, unless otherwise indicated.
 - 3. Material: Aluminum, unless otherwise indicated.

2.04 DOOR PULLS AND PUSH BARS

- A. Manufacturers:
 - 1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. dormakaba; TG9335 Series: www.dormakaba.com/#sle.
 - 3. Hiawatha, Inc, division of Activar Construction Products Group, Inc:
www.activarcpg.com/hiawatha/#sle.
 - 4. Standard Metal Hardware Manufacturing Ltd; Architectural Door Pulls:
www.smhardware.com/#sle.
 - 5. Sugatsune America, Inc; Sliding Door Handles: www.sugatsune.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.
- B. Door Pulls and Push Bars: Comply with BHMA A156.6.
 - 1. Bar Type: Bar set, unless otherwise indicated.
 - 2. Material: Aluminum, unless otherwise indicated.

2.05 CLOSERS

- A. Manufacturers; Surface Mounted:
 - 1. BEST, dormakaba Group; EHD9000: www.bestaccess.com/#sle.
 - 2. Corbin Russwin, Norton, Rixson, Sargent, or Yale; an Assa Abloy Group company:
www.assaabloydss.com/#sle.
 - 3. Hager Companies: www.hagerco.com/#sle.
 - 4. LCN, an Allegion brand: www.allegion.com/us/#sle.
 - 5. Pamex, Inc; Closers: www.pamexinc.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.
- B. Closers: Comply with BHMA A156.4, Grade 1.
 - 1. Type: Surface mounted to door.
 - 2. Provide door closer on each exterior door.
 - 3. Provide door closer on each fire-rated and smoke-rated door.
 - a. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.
 - 4. Where an overlapping astragal is included on pairs of swinging doors, provide coordinator to ensure door leaves close in proper order.
 - 5. At corridor entry doors, mount closer on room side of door.
 - 6. At outswinging exterior doors, mount closer on interior side of door.

2.06 OVERHEAD STOPS AND HOLDERS

- A. Manufacturers:
 - 1. Rixson or Sargent; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. dormakaba; Architectural Hardware 900 Series: www.dormakaba.com/#sle.
 - 3. Glynn-Johnson, an Allegion brand: www.allegion.com/us/#sle.
 - 4. Pamex, Inc; Overhead Stops and Holders: www.pamexinc.com/#sle.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- B. Overhead Stops and Holders (Door Checks): Comply with BHMA A156.8, Grade 1.
 - 1. Provide stop for every swinging door, unless otherwise indicated.
 - 2. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop, unless otherwise indicated.

2.07 PROTECTION PLATES

- A. Manufacturers:
 - 1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Hager Companies: www.hagerco.com/#sle.
 - 3. Hiawatha, Inc, an Activar Construction Products Group company:
www.activarcpg.com/hiawatha/#sle.
 - 4. Ives, an Allegion brand: www.allegion.com/us/#sle.

5. Pamex, Inc; Protection Plates: www.pamexinc.com/#sle.
 6. Trimco: www.trimcohardware.com/#sle.
 7. Substitutions: See Section 016000 - Product Requirements.
- B. Protection Plates: Comply with BHMA A156.6.
- C. Metal Properties: Aluminum material.
1. Metal, Standard Duty: Thickness 0.050 inch (1.27 mm), minimum.
 2. Metal, Heavy Duty: Thickness 0.062 inch (1.57 mm), minimum.
 3. Metal, Extra Heavy Duty - Diamond Plate: Thickness 1/8 inch (3.175 mm), minimum, with raised diamond plate surface.
 4. Metal, Extra Heavy Duty - Flat Plate: Thickness 1/8 inch (3.175 mm), minimum, with smooth plate surface.
- D. Edges: Beveled, on four sides unless otherwise indicated.
- E. Fasteners: Countersunk screw fasteners.

2.08 KICK PLATES

- A. Manufacturers:
1. Hiawatha, Inc, an Activar Construction Products Group company: www.activarcpg.com/hiawatha/#sle.
 2. Ives, an Allegion brand: www.allegion.com/us/#sle.
 3. Standard Metal Hardware Manufacturing Ltd; Door Plates: www.smhardware.com/#sle.
 4. Trimco: www.trimcohardware.com/#sle.
 5. Substitutions: See Section 016000 - Product Requirements.
- B. Kick Plates: Provide along bottom edge of push side of every door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.
1. Size: 8 inch (203 mm) high by 2 inch (51 mm) less door width (LDW) on push side of door.

2.09 WALL STOPS

- A. Manufacturers:
1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 2. Hager Companies: www.hagerco.com/#sle.
 3. Hiawatha, Inc, division of Activar Construction Products Group, Inc: www.activarcpg.com/hiawatha/#sle.
 4. Pamex, Inc; Wall Stops: www.pamexinc.com/#sle.
 5. Standard Metal Hardware Manufacturing Ltd; Wall Stops: www.smhardware.com/#sle.
 6. Trimco: www.trimcohardware.com/#sle.
 7. Substitutions: See Section 016000 - Product Requirements.
- B. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
1. Type: Bumper, concave, wall stop.
 2. Material: Aluminum housing with rubber insert.

2.10 THRESHOLDS

- A. Manufacturers:
1. Dunbarton Corporation: www.dunbarton.com/#sle.
 2. Pemko; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 3. Hager Companies: www.hagerco.com/#sle.
 4. National Guard Products, Inc: www.ngpinc.com/#sle.
 5. Reese Enterprises, Inc: www.reeseusa.com/#sle.
 6. Zero International, Inc: www.zerointernational.com/#sle.
 7. Substitutions: See Section 016000 - Product Requirements.
- B. Thresholds: Comply with BHMA A156.21.

1. Provide threshold at each exterior door, unless otherwise indicated.
2. Type: Flat surface.
3. Material: Aluminum.
4. Threshold Surface: Fluted horizontal grooves across full width.
5. Field cut threshold to profile of frame and width of door sill for tight fit.
6. Provide non-corroding fasteners at exterior locations.

2.11 WEATHERSTRIPPING AND GASKETING

- A. Manufacturers:
 1. Dunbarton Corporation: www.dunbarton.com/#sle.
 2. Pemko; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 3. Hager Companies: www.hagerco.com/#sle.
 4. National Guard Products, Inc: www.ngpinc.com/#sle.
 5. Reese Enterprises, Inc: www.reeseusa.com/#sle.
 6. Zero International, Inc: www.zerointernational.com/#sle.
 7. Substitutions: See Section 016000 - Product Requirements.
- B. Weatherstripping and Gasketing: Comply with BHMA A156.22.
 1. Head and Jamb Type: Adjustable.
 2. Door Sweep Type: Encased in retainer.
 3. Material: Aluminum, with brush weatherstripping.

2.12 SILENCERS

- A. Manufacturers:
 1. Ives, an Allegion brand: www.allegion.com/us/#sle.
 2. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 3. Substitutions: See Section 016000 - Product Requirements.
- B. Silencers: Provide at equal locations on door frame to mute sound of door's impact upon closing.
 1. Single Door: Provide three on strike jamb of frame.
 2. Pair of Doors: Provide two on head of frame, one for each door at latch side.
 3. Material: Rubber, gray color.

2.13 FINISHES

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.
- C. Install hardware for smoke and draft control doors in accordance with NFPA 105.
- D. Use templates provided by hardware item manufacturer.
- E. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
 1. For Steel Doors and Frames: Install in compliance with DHI (LOCS) recommendations.
 2. For Wood Doors: Install in compliance with DHI WDHS.3 recommendations.
- F. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.03 CLEANING

3.04 PROTECTION

- A. Protect finished Work under provisions of Section 017000 - Execution and Closeout Requirements.
- B. Do not permit adjacent work to damage hardware or finish.

END OF SECTION

SECTION 087113 POWER DOOR OPERATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Operators for swinging doors.

1.02 RELATED REQUIREMENTS

- A. Section 084229 - Automatic Entrances.
- B. Section 087100 - Door Hardware: Balance of door hardware.
- C. Section 281000 - Access Control: Connection to access control system; access control devices used as actuators.
- D. Section 284600 - Fire Detection and Alarm: Connection to fire alarm system.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. BHMA A156.10 - Power Operated Pedestrian Doors; 2024.
- C. ITS (DIR) - Directory of Listed Products; Current Edition.
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL (DIR) - Online Certifications Directory; Current Edition.
- G. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings:
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements for additional provisions.
 - 2. Wrenches and other tools required for maintenance of equipment.

1.05 QUALITY ASSURANCE

1.06 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for components of power door operators. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Operators for Swinging Doors:
 - 1. Horton Automatics: www.hortondoors.com/#sle.
 - 2. Stanley Access Technologies; Magic Access LE (Low Energy): www.stanleyaccess.com/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.

2.02 POWER DOOR OPERATORS - GENERAL

- A. See Section 084229 for power door operators included in automatic entrance packages.

- B. Electrically Operated or Controlled Hardware: Provide necessary power supplies, relays, and interfaces as required for proper operation; provide wiring between control components and to building power connection in compliance with NFPA 70.
- C. Comply with ADA Standards for egress requirements.
- D. Comply with NFPA 101 and requirements of authorities having jurisdiction; provide units selected for actual door weight and for light pedestrian traffic unless otherwise indicated.
- E. Exterior and Vestibule Doors: Provide equipment suitable for ambient operating temperature range of minus 20 to plus 140 degrees F (minus 29 to plus 60 degrees C).
- F. Exterior Doors: Provide units capable of operating, closing, and holding doors closed under positive and negative differential pressure; if necessary, provide power closing.
- G. Fire Door Operators: In addition to other requirements, provide equipment ITS (DIR) or UL (DIR) listed as a fire door operator with automatic closer.
- H. System Integration: Integrate operator functionality with other systems as required for a complete working installation.
 - 1. Provide time delay relay to signal automatic door operator to activate only after electric lock system is released.
 - 2. Provide fire alarm interface configurable to safely open or close doors on signal from fire alarm system.
 - a. See Section 284600.
 - 3. Provide controller output signals at the door closed or door open positions to facilitate interaction with security and access control systems.
 - a. See Section 281000.

2.03 OPERATORS FOR SWINGING DOORS

- A. Door Operator: Hydraulic.
 - 1. Applications: Include operators for single and double doors.
 - 2. Hydraulic Operators: ____ hp (____ W) minimum, self-contained, electrically driven.
 - 3. Speed Control: Variable, field-adjustable opening and closing cycles.
 - 4. Functionality: Full-power open, spring close operation.
 - a. Full-Power Operators: Comply with BHMA A156.10; safeties required.
 - 1) Comply with UL 325; acceptable evidence of compliance includes UL (DIR) or ITS (DIR) listing or test report by testing agency acceptable to authorities having jurisdiction.
 - 5. Mounting: Surface mounted overhead.
 - 6. Components:
 - a. Header Case: Manufacturer's standard extruded aluminum profile containing door operator and door mounting components.
 - 7. Power Supply Units: Self-contained, electrically operated, and independent of door operator.
 - 8. Actuators: Manufacturer's standard.
 - a. Push-Side Actuator: Mat switch.
 - b. Pull-Side Actuator: Mat switch.
 - 9. Pull-Side Safety: Door mounted.
 - 10. Hold Open: Toggle switch at inside head of doors; deactivate hold-open on activation of fire alarm system, see Section 28 4600.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available, in the correct location, and of the correct characteristics.

3.02 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.

3.03 CLEANING

- A. Remove temporary protection, clean exposed surfaces.

END OF SECTION

SECTION 088000 GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glazing units.
- B. Laminated glass interlayers.
- C. Glass coatings.
- D. Glazing compounds.

1.02 RELATED REQUIREMENTS

- A. Section 064100 - Architectural Wood Casework: Cabinets with requirements for glass shelves.
- B. Section 084313 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.

1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- E. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- F. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2019.
- G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
- H. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.
- I. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2023.
- J. GANA (GM) - GANA Glazing Manual; 2022.
- K. GANA (SM) - GANA Sealant Manual; 2008.
- L. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (Reaffirmed 2016).
- M. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.
- N. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.
- O. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.
- P. NGA (LGRM) - Laminated Glazing Reference Manual; 2019.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data on Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with for glazing installation methods. Maintain one copy on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.06 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F (4 degrees C).
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Glass Fabricators:
 - 1. Alpen High Performance Products: www.thinkalpen.com/#sle.
 - 2. GGI - General Glass International; ____: www.generalglass.com/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.
- B. Float Glass Manufacturers:
 - 1. Guardian Glass, LLC; ____: www.guardianglass.com/#sle.
 - 2. Pilkington North America Inc; ____: www.pilkington.com/na/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.
- C. Laminated Glass Manufacturers:
 - 1. Cardinal Glass Industries; ____: www.cardinalcorp.com/#sle.
 - 2. Dreamwalls by Gardner Glass Products; Laminated Glass: www.dreamwalls.com/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.
- D. Bird-Friendly Glass Manufacturers:
 - 1. Glasswerks; Glass Printed Bird-Friendly Glass: glasswerks.com/#sle.
 - 2. ORNILUX Bird Protection Glass, developed by ARNOLD GLAS; ____: www.ornilux.com/#sle.
 - 3. Saint Gobain North America; Saint Gobain 4Bird: www.saint-gobain.com/#sle.
 - 4. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle.
 - 5. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
 - 1. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 - 2. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 - 3. Glass thicknesses listed are minimum.
- B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
 - 1. In conjunction with weather barrier related materials described in other sections, as follows:

- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
 3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
- B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.

2.04 GLAZING UNITS

- A. Type G-1 - Monolithic Exterior Vision Glazing:
1. Applications: Exterior glazing unless otherwise indicated.
 2. Glass Type: Annealed float glass.
 3. Tint: Clear.
 4. Thickness: 1/4 inch (6.4 mm), nominal.
- B. Type G-6 - Hurricane Impact Resistance Glazing: Laminated glass, 3-Ply.
1. Applications: Locations as indicated on drawings.
 2. Tint: Clear.
 3. Thickness: As required to meet performance criteria.
 4. Outside Lite: Annealed glass.
 5. Interlayer: Polyvinyl butyral (PVB), thickness as required to meet performance criteria.
 6. Middle Lite: Annealed glass.
 7. Interlayer, Inboard Side: Polyvinyl butyral (PVB), thickness as required to meet performance criteria.
 8. Inside Lite: Annealed glass.
 9. Performance Criteria:
 - a. Hurricane Impact Resistance: Comply with ASTM E1996 windborne debris requirements for "Enhanced Protection" within Wind Zone 1.
 10. Visible Light Transmittance (VLT): _____ percent, nominal.
 11. Shading Coefficient: _____, nominal.
 12. Solar Heat Gain Coefficient (SHGC): _____, nominal.
 13. Visible Light Reflectance, Outside: _____ percent, nominal.
 14. Glazing Method: As required to meet performance criteria.

2.05 GLASS COATINGS

- A. Solar Control Coating: Two-component, metal-oxide nano-particles with 5 percent solids content, minimum.
1. Application: Locations as indicated on drawings.
 2. Color: Clear, fade resistant.
 3. Dry Film Thickness: 10 microns (0.01 mm), bubble and crack resistant.
- B. Bird-Protecting UV Strip Coating: Ultra-violet (UV) vertical stripe coating applied on #1 surface of outer pane of an IGU, visible to birds to prevent collisions with impending barrier, and virtually invisible to human eye in dry conditions.
1. Application: Locations as indicated on drawings.
 2. Coating provides acceptable avoidance index score from American Bird Conservancy for different sizes and species of birds.
 3. Manufacturers:

- a. Guardian Glass, LLC; Guardian Bird1st UV: www.guardianglass.com/#sle.

2.06 GLAZING COMPOUNDS

- A. Type GC-2 - Butyl Sealant: Single component; ASTM C920 Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.
- B. Type GC-5 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; _____ color.

2.07 ACCESSORIES

- A. Concealed nonprogressive structural glass mounting system.
 - 1. Glass Panel Mounting System: Two-part patented system of interlocking metal rail brackets structurally connected to substrate surface and backs of glass units for concealed support.
 - a. Applications: As indicated on drawings for wall mounted glass units.
 - b. Mounting Action: Hook shape of mounting rail bracket interlocks with hook shape of another mounting bracket.
 - c. Maximum Reveal Width Between Panel Edges: 1/4 inch (6.4 mm) at completed installation.
- B. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) by width of glazing rabbet space minus 1/16 inch (1.5 mm) by height to suit glazing method and pane weight and area.
- C. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch (75 mm) long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- D. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
- E. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.
- F. Glazing Clips: Manufacturer's standard type.

2.08 SOURCE QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Provide shop inspection and testing for Type _____ glass.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

- A. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - WET GLAZING METHOD (SEALANT AND SEALANT)

- A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
- B. Place setting blocks at 1/4 points and install glazing pane or unit.
- C. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch (610 mm) intervals, 1/4 inch (6.4 mm) below sight line.
- D. Fill gaps between glazing and stops with _____ type sealant to depth of bite on glazing, but not more than 3/8 inch (9 mm) below sight line to ensure full contact with glazing and continue the air and vapor seal.
- E. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.06 INSTALLATION - WET GLAZING METHOD (COMPOUND AND COMPOUND)

- A. Application - Interior Glazed: Set glazing infills from the interior of the building.
- B. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch (610 mm) centers, kept 1/4 inch (6 mm) below sight line.
- C. Locate and secure glazing pane using glazers' clips.
- D. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.07 INSTALLATION - WET/DRY GLAZING METHOD (PREFORMED TAPE AND SEALANT)

- A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
- B. Cut glazing tape to length and set against permanent stops, 3/16 inch (5 mm) below sight line. Seal corners by butting tape and dabbing with butyl sealant.
- C. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.
- D. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.
- E. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.
- F. Install removable stops, with spacer strips inserted between glazing and applied stops 1/4 inch (6.4 mm) below sight lines.
 - 1. Place glazing tape on glazing pane of unit with tape flush with sight line.
- G. Fill gap between glazing and stop with _____ type sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch (9 mm) below sight line.
- H. Apply cap bead of _____ type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.08 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.

- B. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
- C. Monitor and report installation procedures and unacceptable conditions.

3.09 CLEANING

- A. See Section 017419 - Construction Waste Management and Disposal, for additional requirements.
- B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- C. Remove nonpermanent labels immediately after glazing installation is complete.
- D. Clean glass and adjacent surfaces after sealants are fully cured.
- E. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.10 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

3.11 SCHEDULES

- A. Aluminum Entrance Window Glazing: Glass , install glass using wet/dry method with glazing compound.

END OF SECTION

SECTION 088300 MIRRORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glass mirrors.
 - 1. Annealed float glass.
 - 2. Tempered safety glass.

1.02 RELATED REQUIREMENTS

- A. Section 062000 - Finish Carpentry: Wood mirror frames.

1.03 REFERENCE STANDARDS

- A. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- B. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
- C. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.
- D. GANA (GM) - GANA Glazing Manual; 2022.
- E. GANA (SM) - GANA Sealant Manual; 2008.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with for glazing installation methods.

1.06 FIELD CONDITIONS

- A. Do not install mirrors when ambient temperature is less than 50 degrees F (10 degrees C).
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Mirror Design Criteria: Select materials and/or provide supports as required to limit mirror material deflection to 1/200, or to the flexure limit of glass, with full recovery of glazing materials, whichever is less.
- B. Mirror Glass: Clear, annealed float glass; ASTM C1036, with copper and silver coatings, and protective overcoating.
 - 1. Thickness: 1/4 inch (6.4 mm).
 - 2. Edges: Arrised.
 - 3. Size: As indicated on drawings.

2.02 ACCESSORIES

- A. Glazing Clips: Manufacturer's standard type.
- B. Channel Frame: One piece, channel frame, stainless steel, Type 430, satin finish, 1/2 inch by 1/2 inch by 3/8 inch deep (12.7 mm by 12.7 mm by 9.5 mm deep) with 90 degree mitered corners.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that openings for mirrored glazing are correctly sized and within tolerance.

- B. Verify that surfaces of mirror frames or recesses are clean, free of obstructions, and ready for installation of mirrors.

3.02 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous mirror frames or recesses with substrate compatible primer or sealer. Prime surfaces scheduled to receive sealant.
- C. Prepare installation in accordance with ASTM C1193 for solvent release sealants, and install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION

- A. Install mirrors in accordance with manufacturer's recommendations.
- B. Set mirrors plumb and level, and free of optical distortion.
- C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

3.04 CLEANING

- A. Remove wet glazing materials from finish surfaces.
- B. Remove labels after work is complete.
- C. Clean mirrors and adjacent surfaces.

END OF SECTION

SECTION 089100 LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Louvers, frames, and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 072500 - Weather Barriers: Sealing frames to water-resistive barrier installed on adjacent construction.

1.03 REFERENCE STANDARDS

- A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- B. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2023.
- C. AMCA 511 - Certified Ratings Program Product Rating Manual for Air Control Devices; 2021, with Editorial Revision (2022).
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- E. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- F. FEMA P-361 - Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms; 2024.
- G. ICC 500 - ICC/NSSA Standard for the Design and Construction of Storm Shelters; 2020.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Test Reports: Independent agency reports showing compliance with specified performance criteria.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Louvers:
 - 1. Airline Louvers; ____: www.airlinelouvers.com/#sle.
 - 2. Airolite Company, LLC; ____: www.airolite.com/#sle.
 - 3. Industrial Louvers, Inc; ____: www.industriallouvers.com/#sle.
 - 4. Substitutions: See Section 016000 - Product Requirements.

2.02 LOUVERS

- A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.
 - 1. High-Velocity Wind Load Resistance: Design to comply with applicable requirements of ICC 500 and FEMA P-361, including resistance to horizontal debris impact.
 - 2. Intake Louvers: Design to allow maximum of 0.01 oz/sq ft (3.1 g/sq m) water penetration at calculated intake design velocity based on design air flow and actual free area, when tested in accordance with AMCA 500-L.
 - 3. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.

4. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.
5. Hinged Units: Provide secondary frame to which louver frame is attached; non-ferrous hinges; provide at _____.

2.03 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), _____ alloy, _____ temper.

2.04 FINISHES

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

2.05 ACCESSORIES

- A. Blank-Off Panels: Same material as louver, painted black on exterior side; provide where duct connected to louver is smaller than louver frame, sealing off louver area outside duct.
- B. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.
- C. Insect Screen: 18 x 16 size aluminum mesh.
- D. Fasteners and Anchors: Galvanized steel.
- E. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.
- F. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared openings and flashings are ready to receive this work and opening dimensions are as indicated on shop drawings.
- B. Verify that field measurements are as indicated.

3.02 INSTALLATION

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Install louvers level and plumb.
- C. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- D. Secure louver frames in openings with concealed fasteners.

3.03 CLEANING

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

END OF SECTION

SECTION 092116 GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Metal channel ceiling framing.
- D. Acoustic insulation.
- E. Gypsum sheathing.
- F. Cementitious backing board.
- G. Gypsum wallboard.
- H. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 054000 - Cold-Formed Metal Framing: Structural steel stud framing.
- B. Section 072500 - Weather Barriers: Water-resistive barrier over sheathing.
- C. Section 072600 - Vapor Retarders: Vapor-impermeable membranes.
- D. Section 072700 - Air Barriers: Air- and water-resistive barrier over sheathing.

1.03 REFERENCE STANDARDS

- A. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data; 2017.
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
- D. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
- E. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
- F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- G. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.
- H. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.
- I. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
- J. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.
- K. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2018 (Reapproved 2023).
- L. ASTM C1288 - Standard Specification for Fiber-Cement Interior Substrate Sheets; 2023.
- M. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022, with Editorial Revision (2023).
- N. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- O. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2023.

- P. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- Q. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- R. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- S. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- T. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- U. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.
- C. Store metal products to prevent corrosion.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.02 METAL FRAMING MATERIALS

- A. Material and Product Requirements Criteria: AISI S201.
- B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
 - 1. Corrosion Protection Coating Designation: G40, or equivalent in accordance with AISI S220.
- C. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).
 - 1. Studs: C-shaped.
 - 2. Runners: U shaped, sized to match studs.
 - 3. Ceiling Channels: C-shaped.

2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. American Gypsum Company: www.americangypsum.com/#sle.
 - 2. USG Corporation: www.usg.com/#sle.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 - 2. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 - 3. Thickness:

4. Paper-Faced Products:
 - a. American Gypsum Company; LightRoc Gypsum Wallboard: www.americangypsum.com/#sle.
 - b. USG Corporation; Sheetrock Brand EcoSmart Panels Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.
 - c. USG Corporation; Sheetrock Brand Firecode X Panels 5/8 in. (15.9 mm): www.usg.com/#sle.
 - d. USG Corporation; Sheetrock Brand Gypsum Panels 1/4 in. (6.4 mm): www.usg.com/#sle.
 - e. Substitutions: See Section 016000 - Product Requirements.
5. Mold-Resistant, Paper-Faced Products:
 - a. American Gypsum Company; M-Bloc Type X: www.americangypsum.com/#sle.
 - b. American Gypsum Company; M-Bloc Type C: www.americangypsum.com/#sle.
 - c. USG Corporation; Sheetrock Brand EcoSmart Panels Mold Tough Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.
 - d. USG Corporation; Sheetrock Brand Mold Tough Firecode SCX Panels 5/8 in. (15.9 mm): www.usg.com/#sle.
- C. Backing Board For Wet Areas: One of the following products:
 1. Application: Surfaces behind tile in wet areas, including manufactured housing, tub and shower surrounds, and shower ceilings.
 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
 - a. Thickness: 5/8 inch (16 mm).
 - b. Products:
 - 1) USG Corporation; Fiberock Brand Aqua-Tough AR Interior Panels Regular 5/8 in. (15.9 mm): www.usg.com/#sle.
 - 2) USG Corporation; Fiberock Brand Aqua-Tough AR Interior Panels XRX-G 5/8 in. (15.9 mm): www.usg.com/#sle.
 - 3) Substitutions: See Section 016000 - Product Requirements.
 4. ASTM Cement-Based Board: Non-gypsum-based, cementitious board complying with ASTM C1288.
 - a. Thickness: 1/2 inch (13 mm).
- D. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
 1. Application: Exterior sheathing, unless otherwise indicated.
 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 3. Fungal Resistance: No fungal growth when tested in accordance with ASTM G21.
 4. Type X Thickness: 5/8 inch (16 mm).
 5. Edges: Square.
- E. Shaftwall and Coreboard: Type X; 1 inch (25 mm) thick by 24 inches (600 mm) wide, beveled long edges, ends square cut.
 1. Paper-Faced Type: Gypsum shaftliner board or gypsum coreboard as defined ASTM C1396/C1396M; water-resistant faces.
 2. Paper-Faced Products:
 - a. American Gypsum Company; M-Bloc Shaft Liner: www.americangypsum.com/#sle.
 - b. USG Corporation; Sheetrock Brand Gypsum Liner Panels 1 in. (25.4 mm) SLX: www.usg.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.

2.04 GYPSUM BOARD ACCESSORIES

- A. Acoustic Insulation: ASTM C665; preformed mineral-fiber, friction fit type, unfaced; thickness 2 inches (50.8 mm).

- B. Fire and Sound Attenuating Insulation: Sprayed cellulose fire-rated material for cavities in wall assemblies.
 - 1. Surface Burning Characteristics: Provide assemblies with Class I rating, when tested in accordance with ASTM E84.
 - 2. Sound Transmission Class (STC): 56, calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- C. Sound Isolation Tape: Elastomeric foam tape for sound decoupling.
 - 1. Surface Burning Characteristics: Provide assemblies with flame spread index of 75 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - 2. Tape Thickness: 1/4 inch (6 mm).
 - 3. Products:
 - a. Substitutions: See Section 016000 - Product Requirements.
- D. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
 - 1. Products:
 - a. Franklin International, Inc; Titebond Acoustical Smoke & Sound Sealant: www.titebond.com/#sle.
 - b. Liquid Nails, a brand of PPG Architectural Coatings; _____: www.liquidnails.com/#sle.
 - c. Specified Technologies Inc; Smoke N Sound Acoustical Sealant: www.stifirestop.com/#sle.
- E. Water-Resistive Barrier: See Section 072500.
- F. Vapor Retarder: See Section 072600.
- G. Air Barrier: See Section 072700.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 SHAFT WALL INSTALLATION

- A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
 - 1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches (600 mm) on center.
 - 2. Install studs at spacing required to meet performance requirements.
- B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.
 - 1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
 - 2. Seal perimeter of shaft wall and penetrations with acoustical sealant.

3.03 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C1007/AISI S220 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
 - 1. Level ceiling system to a tolerance of 1/1200.
 - 2. Laterally brace entire suspension system.
 - 3. Install bracing as required at exterior locations to resist wind uplift.
- C. Studs: Space studs at 16 inches on center (at 406 mm on center).
 - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

3.04 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Sound Isolation Tape: Apply to vertical studs and top and bottom tracks/runners in accordance with manufacturer's instructions.
- C. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.05 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
 - 1. Paper-Faced Sheathing: Immediately after installation, protect from weather by application of water-resistive barrier.
- C. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

3.06 JOINT TREATMENT

- A. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.
- C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

3.07 CLEANING

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Clean _____.

3.08 PROTECTION

- A. Protect installed gypsum board assemblies from subsequent construction operations.

END OF SECTION

SECTION 092236 LATH

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal lath for cement and gypsum plaster.
- B. Furring for metal lath.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Lath and Accessories:
 - 1. Alabama Metal Industries Corporation; Self-Furred Diamond Mesh Lath: www.amico-lath.com/#sle.
 - 2. CEMCO: www.cemcosteel.com/#sle.
 - 3. MarinoWARE: www.marinoware.com/#sle.
 - 4. Phillips Manufacturing Co; Paperback Lath: www.phillipsmfg.com/#sle.
 - 5. Semco Southeastern Metals: www.semetals.com/#sle.

2.02 LATH

END OF SECTION

SECTION 092400 CEMENT PLASTERING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cement plastering.

1.02 RELATED REQUIREMENTS

- A. Section 072500 - Weather Barriers: Water-resistive barrier.
- B. Section 092236 - Lath: Lath, furring, beads, screeds, and joint accessories for plaster base.
- C. Section 099113 - Exterior Painting.

1.03 REFERENCE STANDARDS

- A. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.
- B. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- C. ASTM C897 - Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters; 2015 (Reapproved 2020).
- D. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster; 2023a.
- E. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- F. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittals procedures.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.06 FIELD CONDITIONS

- A. Exterior Plaster Work: Do not apply plaster when substrate or ambient air temperature is 40 degrees F (4 degrees C) or lower, or when temperature is expected to drop below 40 degrees F (4 degrees C) within 48 hours of application.

PART 2 PRODUCTS

2.01 CEMENT PLASTER APPLICATIONS

- A. Lath Plaster Base: Metal lath.
 - 1. Plaster Type: Factory prepared plaster mix.
 - 2. Number of Coats: Three.
 - 3. First Coat: Apply to a nominal thickness of 3/8 inch (9 mm).
 - 4. Second Coat: Apply to a nominal thickness of 3/8 inch (9 mm).
 - 5. Leveling Coat: Apply to a nominal thickness of 1/32 to 1/16 inch (0.79 to 1.6 mm).
 - 6. Finish: Acrylic.

2.02 FACTORY PREPARED CEMENT PLASTER

- A. Fire-Resistance Rating: Determined in accordance with test procedures in ASTM E119 and complying with the following:
- B. Exterior Portland cement plaster system made of scratch and brown base coat, leveling coat with reinforcing mesh, and acrylic finish coat; install in accordance with ASTM C926.
 - 1. Provide weather resistive barrier as part of the system, by the same manufacturer.
 - 2. Manufacturer - Basis of Design:
 - a. Sika Corporation; Parex Armourwall 300: www.parex.com/#sle.

3. Other Acceptable Manufacturers:
 - a. Dryvit Systems, Inc; Dryvit Stucco One-Coat System:
www.dryvit.com/systems/stucco/#sle.
 - b. Sika Corporation; LaHabra FastWall 300-W HE:
www.usa.sika.com/en/construction/eifs-stucco.html/#sle.
 - c. Sika Corporation; Senergy Platinum CI Stucco Ultra:
www.usa.sika.com/en/construction/eifs-stucco.html/#sle.

2.03 JOBSITE MIXED CEMENT PLASTER

- A. Fire Resistance Rating: Determined in accordance with test procedures in ASTM E119 and complying with:
 1. ICC (IBC), Section .
- B. Materials:
 1. Portland Cement: ASTM C150/C150M, Type I.
 - a. Finish Coat: White color.
 2. Masonry Cement: ASTM C91/C91M, Type N.
 3. Sand: Clean, well graded, and complying with ASTM C897.
 4. Water: Clean, fresh, potable, and free of mineral or organic matter that could adversely affect plaster.
- C. Plaster Mixes: Proportioned in accordance with ASTM C926; parts by volume.
 1. First Coat Over Lath:
 - a. Plaster Mix "C": One part Portland cement, with minimum zero part and maximum 3/4 part hydrated lime.
 - b. Plaster Mix "CL": One part Portland cement, with minimum 3/4 part and maximum 1-1/2 parts hydrated lime.
 - c. Minimum 2-1/2 parts and maximum 4 parts sand, per total volume of cementitious materials.
 2. First Coat Over Low Absorption Solid Base:
 - a. Minimum 2-1/2 parts and maximum 4 parts sand, per total volume of cementitious materials.

2.04 ACCESSORIES

- A. Lath: See Section 092236.
- B. Finishing Accessories: See Section 092236.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting this work.
- B. Verify masonry joints are flush and surfaces are ready to receive work of this section, and that there are no existing bituminous or water repellent coatings on masonry surfaces.
- C. Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are properly in place.

3.02 PREPARATION

- A. Dampen masonry surfaces to reduce excessive suction.

3.03 INSTALLATION - WATER-RESISTIVE BARRIER

- A. Where cement plaster is installed as part of a barrier wall system, install two layers of water-resistive barrier in accordance with water-resistive barrier manufacturer's instructions.
- B. Integrate water-resistive barrier with flashing accessories, and adjacent doors, windows, penetrations, and cladding transitions.

3.04 MIXING

- A. Mix only as much plaster as can be used prior to initial set.

- B. Mix materials dry, to uniform color and consistency, before adding water.
- C. Protect mixtures from frost or freezing temperatures, contamination, and excessive evaporation.

3.05 APPLICATION

- A. Apply plaster in accordance with manufacturer's written instructions and comply with ASTM C926.
- B. Base Coats:
 - 1. Apply base coat(s) to fully embed lath and to specified thickness.
 - 2. Follow guidelines in ASTM C926 and manufacturer's written installation instructions for moist curing base coats and application of subsequent coats.
- C. Leveling Coat:
 - 1. Apply leveling coat to specified thickness.
- D. Finish Coats:
 - 1. Cement Plaster:
 - a. Apply with sufficient material and pressure to ensure complete coverage of base to specified thickness.
 - b. Apply desired surface texture while mix is still workable.
 - 2. Primer and Acrylic Coatings:
 - a. Remove surface contaminants such as dust and dirt without damaging substrate.
 - b. Apply primer in accordance with manufacturer's instructions.
 - c. Apply finish coating in number of coats and to thickness recommended by manufacturer.

END OF SECTION

SECTION 093000 TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Cementitious backer board as tile substrate.
- D. Coated glass mat backer board as tile substrate.
- E. Ceramic accessories.

1.02 RELATED REQUIREMENTS

- A. Section 035400 - Cast Underlayment: Hydraulic and cementitious underlayments where required by TCNA (HB) or TCNA (HB-GP) method specified.
- B. Section 079200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- C. Section 092400 - Cement Plastering: Lath and Portland cement scratch coat where required by TCNA (HB) or TCNA (HB-GP) method specified.
- D. Section 224000 - Plumbing Fixtures: Shower receptor.

1.03 REFERENCE STANDARDS

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2024.
- B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
- C. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2023.
- D. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2019.
- E. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
- F. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.
- G. ANSI A326.3 - American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials; 2021.
- H. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).
- I. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2025.
- J. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2023.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.

- D. Certificate: Certify products of this section meet or exceed specified requirements.
- E. Installer's qualification statement.
 - 1. Submit documentation of Natural Stone Institute Accreditation.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
- B. Installer Qualifications: Natural Stone Institute (NSI) Accredited Commercial B Contractor, light commercial: www.naturalstoneinstitute.org/#sle.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature above 50 degrees F (10 degrees C) and below 100 degrees F (38 degrees C) during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Tile:
 - 1. American Olean Corporation: www.americanolean.com/#sle.
 - 2. Architessa: www.architessa.com/#sle.
 - 3. Dal-Tile Corporation: www.daltile.com/#sle.
 - 4. Emser Tile, LLC: www.emser.com/#sle.
 - 5. Florim USA: www.milestonetiles.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.
 - 7. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.
- B. Setting Materials:
 - 1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
 - 2. Bostik Inc: www.bostik.com/#sle.
 - 3. Custom Building Products: www.custombuildingproducts.com/#sle.
 - 4. H.B. Fuller Construction Products, Inc: www.tecspecialty.com/#sle.
 - 5. LATICRETE International, Inc: www.laticrete.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.
- C. Grout:
 - 1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
 - 2. Bostik Inc: www.bostik.com/#sle.
 - 3. Custom Building Products: www.custombuildingproducts.com/#sle.
 - 4. H.B. Fuller Construction Products, Inc: www.tecspecialty.com/#sle.
 - 5. LATICRETE International, Inc: www.laticrete.com/#sle.
 - 6. Litokol USA: www.tiledoctor.com/#sle.
 - 7. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Floor Tile: Provide tile for flooring applications with minimum wet Dynamic Coefficient of Friction (DCOF) of 0.42 when tested in accordance with ANSI A326.3.

2.03 TILE

- A. Porcelain Tile: ANSI A137.1 standard grade.
 - 1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 - 2. Size: 6 by 6 inch (152 by 152 mm), nominal.
 - 3. Thickness: 3/8 inch (9.5 mm).
 - 4. Edges: Interlocking shape.
 - 5. Surface Finish: Unglazed.
 - 6. Color: As selected by Architect from manufacturer's standard range.
 - 7. Products:
 - a. Architessa: www.architessa.com/#sle.
 - b. Dal-Tile Corporation; Xteriors: www.daltile.com/#sle.
 - c. Dal-Tile Corporation; Revo-Tile: www.daltile.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.

2.04 TRIM AND ACCESSORIES

- A. Ceramic Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.

2.05 SETTING MATERIALS

- A. Cement Plaster and Lath: See Section 092400.
- B. Cementitious Underlayments: See Section 035400.
- C. Provide setting and grout materials from same manufacturer.
- D. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
 - 1. Products:
 - a. ARDEX Engineered Cements; ARDEX X 5: www.ardexamericas.com/#sle.
 - b. Custom Building Products; ProLite Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer: www.custombuildingproducts.com/#sle.
 - c. H.B. Fuller Construction Products, Inc; TEC TotalFlex 110 Universal Mortar: www.tecspecialty.com/#sle.
 - d. Mapei Corporation; Adesilex P10 Mosaic & Glass Tile: www.mapei.com/#sle.
 - e. Litokol USA; Hyperflex K100: www.tiledoctor.com/#sle.
 - f. Sika Corp; SikaTile 300 Set: www.sika.com/#sle.
 - g. Substitutions: See Section 016000 - Product Requirements.

2.06 GROUTS

- A. Provide setting and grout materials from same manufacturer.
- B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
 - 1. Applications: Use where indicated on drawings and where no other type of grout is indicated.
 - 2. Use sanded grout for joints 1/8 inch (3.2 mm) wide and larger; use unsanded grout for joints less than 1/8 inch (3.2 mm) wide.

2.07 MAINTENANCE MATERIALS

- A. Tile Sealant: See Section 079200.

2.08 ACCESSORY MATERIALS

- A. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 7/16 inch (11 mm) thick; 2-inch (51 mm) wide coated glass fiber tape for joints and corners.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive tile.

- B. Verify wall surfaces are smooth and flat within tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

3.02 PREPARATION

- A. Vacuum clean surfaces and damp clean.
- B. Seal substrate surface cracks with filler.
- C. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to feather edge.

3.03 INSTALLATION - GENERAL

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108/A118/A136, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.
- B. Lay tile to pattern indicated on drawings. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install ceramic accessories rigidly in prepared openings.
- G. Sound tile after setting. Replace hollow sounding units.
- H. Keep control and expansion joints free of mortar, grout, and adhesive.
- I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- J. Grout tile joints unless otherwise indicated on drawings. Use standard grout unless otherwise indicated on drawings.
- K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

- A. Over exterior concrete substrates, install in accordance with TCNA (HB) Method F102, with standard grout.

3.05 INSTALLATION - FLOORS - FLOATING

- A. Install in accordance with manufacturer's instructions.
- B. Grout with standard grout.

3.06 INSTALLATION - WALL TILE

- A. On exterior walls, install in accordance with TCNA (HB) Method W244E, thin-set over cementitious backer units, with waterproofing membrane.

3.07 CLEANING

- A. Clean tile and grout surfaces.

3.08 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

SECTION 095100 ACOUSTICAL CEILINGS - USG

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling systems.
- B. Acoustical and nonacoustical units.
- C. Wall angles and shadow moldings.
- D. Special trims and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 265100 - Interior Lighting: Light fixtures.
- B. Section 275116 - Public Address Systems: Speakers.
- C. Section 284600 - Fire Detection and Alarm: Fire alarm components.

1.03 REFERENCE STANDARDS

- A. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019.
- B. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.
- C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019 (Reapproved 2025).
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- E. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- F. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate work of this section with installation of mechanical and electrical components and with other construction activities affected by work of this section.
- B. Sequencing: Schedule work of affected trades to minimize or eliminate installation conflicts and rework.
 - 1. Ensure that acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.

1.06 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent before, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 CEILING ASSEMBLIES

- A. Refer to Room Finish Schedule and Reflected Ceiling Plans on drawings for additional ceiling assembly information.
- B. Acoustical Ceiling Assembly Type APC-1:
 - 1. Acoustical Units: Orion 60 1/2", Item No. _____.
 - a. Panel Size: 24 inches by 48 inches (2 by 4) panel (609.6 mm by 1219.2 mm).
 - b. Panel Edge: SQ edge.

- c. Color: Flat White.
- 2. Suspension Grid: Donn Centricitee DXT 9/16-inch Suspension System.
 - a. Color: Reserve white.

2.02 CEILING PERFORMANCE REQUIREMENTS

- A. Design for maximum deflection of 1/360 of span.
- B. Fire-Resistance Rating: Determined in accordance with test procedures in ASTM E119 and complying with the following:

2.03 CEILING COMPONENT PRODUCTS

- A. Acoustical Units:
 - 1. Acoustical Units - General: ASTM E1264, Fire Class A.
 - a. VOC Content: As specified in Section 016116.
 - b. Noise Reduction Coefficient (NRC) rating, Ceiling Attenuation Class (CAC) rating, and Light Reflectance Coefficient (LR) performance for each type of unit specified below, as determined in accordance with ASTM E1264.
 - c. Fire Class / Surface Burning Characteristics: Determined in accordance with test method ASTM E84.
 - 2. Acoustical Panels: Painted mineral fiber, with the following characteristics:
 - a. Application(s): Fire-resistance-rated assemblies.
 - b. Classification: ASTM E1264 Type III.
 - c. Products:
 - 1) USG Corporation; Orion 60 1/2" Panels: www.usg.com/ceilings/#sle.
 - 3. Acoustical Panels: Mineral fiber with membrane-faced overlay, with the following characteristics:
 - a. Classification: ASTM E1264 Type IV.
 - b. Products:
 - 1) USG Corporation; Centricitee DXLT 9/16 Inch Suspension System: www.usg.com/ceilings/#sle.
- B. Suspension Systems:
 - 1. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with wall angles and moldings, curtain pockets, and splices as required.
 - 2. Exposed Acoustical Suspension System: Hot-dipped galvanized steel grid and cap.
 - a. Application(s): Fire-resistance-rated assemblies.
 - b. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
 - c. Profile: Tee; 9/16 inch (14 mm) face width.
 - d. Color: Flat White 050.
 - e. Products:
 - 1) USG Corporation; Centricitee DXLT 9/16 Inch Suspension System: www.usg.com/ceilings/#sle.
- C. Moldings and Trim:
 - 1. Edge Molding, Expansion Joints, and Splices - General: Same material, thickness, and finish as metal pan panels, unless otherwise indicated.
 - 2. Perimeter Wall Moldings: Same metal and finish as grid.
 - a. Size: As required for installation conditions.
 - b. Acoustical Sealant For Perimeter Moldings: Nonhardening, nonskinning, for use in conjunction with suspended ceiling system.
 - 3. Trim Accessories: Manufacturer's standard clips, cleats splice plates, extension plates, closure plates, corner pieces, and similar accessories required for a complete installation.

2.04 ACCESSORIES

- A. Support Channels, Carriers, and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

- B. Hat-Shaped Metal Channels: Steel, 22 gauge, 0.0299 inch (0.76 mm), minimum.
- C. Suspension Wire: Size and type as required for application, seismic requirements, and ceiling system flatness requirement specified.
 - 1. Concealed Suspension:
 - a. Suspension Wire: Steel, annealed, galvanized finish, 12 gauge, 0.0808 (2.05 mm) diameter, complying with ASTM A641/A641M.
- D. Touch-Up Paint for Exposed Surfaces: Type and color to match acoustical units and suspension system grid and trim elements.
- E. Touch-Up Paint For Concealed Items: Zinc rich type, as recommended by ceiling system manufacturer.

2.05 FABRICATION

- A. Shop fabricate ceiling components to the greatest extent possible.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.
- C. Verify that field measurements are as indicated on shop drawings.
- D. Start of installation constitutes acceptance of project conditions.

3.02 PREPARATION

- A. Coordinate the location of hangers with other work.
- B. Install ceiling system after major above-ceiling work is complete.

3.03 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M and manufacturer's instructions and as supplemented in this section.
- B. Install hangers and inserts coordinated with overhead work. Provide additional hangers and supports as required.
- C. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- D. Suspension System, Nonseismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- E. Where ducts, facility services, or equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- G. Support fixture loads using supplementary hangers located within 6 inches (152 mm) of each corner, or support components independently.
- H. Do not eccentrically load system or induce rotation of runners.
- I. Edge Moldings: Install at intersection of ceiling and vertical surfaces and penetrations, using components of maximum length; set level. Provide edge moldings at junction with other ceiling finishes. Miter corners. Provide preformed edge closures to match bullnosed cornered partitions.
 - 1. Use longest practical lengths.

3.04 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.

- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit edge trim neatly against abutting surfaces.
- D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- E. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.
- F. Where round obstructions occur, provide preformed closures to match perimeter molding.

3.05 CLEANING

- A. Clean and touch up minor finish damage. Remove and replace components that cannot be successfully cleaned and repaired.

END OF SECTION

SECTION 096500 RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient sheet flooring.
- B. Resilient tile flooring.
- C. Resilient base.
- D. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

- A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2023.
- B. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2023.
- C. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.
- D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.
- E. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2018.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).
- D. Protect roll materials from damage by storing on end.
- E. Do not double stack pallets.

1.07 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).

PART 2 PRODUCTS

2.01 SHEET FLOORING

2.02 TILE FLOORING

- A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness.
 - 1. Manufacturers:
 - a. Armstrong Flooring; Excelon SDT: www.armstrongflooring.com/#sle.
 - b. Tarkett Flooring: www.tarkett.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.

2. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
3. Size: 12 by 12 inch (305 by 305 mm).
4. Thickness: 0.125 inch (3.2 mm).

2.03 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TP, rubber, thermoplastic; style as scheduled.
 1. Manufacturers:
 - a. Flexco Corporation; Base Sculptures: www.flexcofloors.com/#sle.
 - b. Mannington Commercial; _____: www.manningtoncommercial.com/#sle.
 - c. Roppe Corporation; Contours Profiled Wall Base System: www.roppe.com/#sle.
 - d. Tarkett Flooring: www.tarkett.com/#sle.
 - e. Substitutions: See Section 016000 - Product Requirements.
 2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
 3. Height: 4 inches (100 mm).
 4. Thickness: 0.125 inch (3.2 mm).
 5. Finish: Satin.

2.04 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
 1. VOC Content Limits: As specified in Section 016116.
- C. Adhesive for Vinyl Flooring:
 1. Manufacturers:
 - a. H.B. Fuller Construction Products, Inc; TEC Flexera 2K PSA Hybrid Adhesive: www.tecspecialty.com/#sle.
 - b. H.B. Fuller Construction Products, Inc; TEC Flexera HT - High Tack Premium Universal PSA Adhesive: www.tecspecialty.com/#sle.
 - c. Loba-Wakol, LLC; WAKOL MS 552 Resilient and Rubber Flooring Adhesive: www.loba-wakol.com/#sle.
 - d. Stauf USA, LLC; D737 High-Tack: www.staufusa.com/#sle.
 - e. Substitutions: Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

3.02 PREPARATION

- A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI (RWP).
- B. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- C. Prohibit traffic until filler is fully cured.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.

3.04 INSTALLATION - SHEET FLOORING

- A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.

3.05 INSTALLATION - TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

3.06 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.
- B. Install base on solid backing. Bond tightly to wall and floor surfaces.

END OF SECTION

SECTION 096813 TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Carpet tile, fully adhered.
- B. Removal of existing carpet tile.

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Tile Carpeting:
 - 1. Interface, Inc: www.interface.com/#sle.
 - 2. Mannington Commercial: www.manningtoncommercial.com/#sle.
 - 3. Milliken & Company; OBEX Tile - CutX: www.milliken.com/#sle.
 - 4. Mohawk Group: www.mohawkgroup.com/#sle.

2.02 MATERIALS

- A. Tile Carpeting: Tufted, manufactured in one color dye lot.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet tile.
- C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- D. Verify that required floor-mounted utilities are in correct location.

3.02 INSTALLATION

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions.
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
- F. Trim carpet tile neatly at walls and around interruptions.
- G. Complete installation of edge strips, concealing exposed edges.

3.03 CLEANING

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- C. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 099113 EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

- A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.05 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Paints:
 - 1. Behr Paint Company; _____: www.behr.com/#sle.
 - 2. Cloverdale Paint, Brand Products of Rodda Paint Company; _____: www.cloverdalepaint.com/#sle.
 - 3. Sherwin-Williams Company; _____: www.sherwin-williams.com/#sle.
- B. Primer Sealers: Same manufacturer as top coats.

C. Substitutions: See Section 016000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.

PART 3 EXECUTION

3.01 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

3.02 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance.
- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.03 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.04 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 099123 INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Materials for backpriming woodwork.
- D. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- E. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

- A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Provide lighting level of 80 fc (860 lux) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints:

1. Behr Paint Company: www.behr.com/#sle.
 2. Cloverdale Paint, Brand Products of Rodda Paint Company:
www.cloverdalepaint.com/#sle.
 3. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 016000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

2.03 PRIMERS

- A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
1. Alkali Resistant Water Based Primer; MPI #3.
 - a. Products:
 - 1) Behr Concrete and Masonry Bonding Primer [No.880]. (MPI #3)
 - 2) Behr Premium Plus Interior/Exterior Multi-Surface Primer and Sealer [No.436]. (MPI #3)
 - 3) Behr Pro High-Build Interior Primer [PR040].
 - 4) Sherwin-Williams Loxon Water Blocking Primer/Finish.
 - 5) Substitutions: See Section 016000 - Product Requirements

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

END OF SECTION

SECTION 102113.13 METAL TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal toilet compartments.
- B. Urinal and Vestibule screens.

1.02 RELATED REQUIREMENTS

- A. Section 061000 - Rough Carpentry: Blocking and supports.
- B. Section 102800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Toilet Compartments:
 - 1. All American Metal Corp - AAMCO; Stainless Steel: www.allamericanmetal.com/#sle.
 - 2. ASI Accurate Partitions; Stainless Steel: www.asi-accuratepartitions.com/#sle.
 - 3. Monarch Toilet Partition Inc; ____: www.monarchpartition.com/#sle.
 - 4. Partition Manufacturers of America, Inc; ____: www.partitioninc.com/#sle.
 - 5. Substitutions: Section 016000 - Product Requirements.

2.02 MATERIALS

- A. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

2.03 COMPONENTS

- A. Toilet Compartments: Powder coated steel, floor-mounted unbraced.
- B. Doors, Panels, and Pilasters: Sheet steel faces, pressure bonded to sound-deadening core, corners made with corner clips or mitered, welded, and ground smooth.

2.04 ACCESSORIES

- A. Head Rails: Hollow anodized aluminum tube, 1 by 1-5/8 inches (25 by 41 mm) in size, with anti-grip strips and cast socket wall brackets.
- B. Brackets: Polished chrome-plated non-ferrous cast metal.
- C. Hardware: Polished chrome plated non-ferrous cast metal:
 - 1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
 - 2. Thumb turn or sliding door latch with exterior emergency access feature.
 - 3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
 - 4. Coat hook with rubber bumper; one per compartment, mounted on door.
 - 5. Provide door pull for outswinging doors.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

- B. Maintain 3/8 to 1/2 inch (9 to 13 mm) space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch (6 mm).
- B. Maximum Variation From Plumb: 1/8 inch (3 mm).

3.04 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch (5 mm).
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 102600 WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Corner guards.

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.
- C. Maintenance Data: Manufacturer's instructions for care and cleaning of each type of product. Include information about both recommended and potentially detrimental cleaning materials and methods.

1.03 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Bumper Rails, Crash Rails, Protective Corridor Handrails, and Corner Guards:
 - 1. Construction Specialties, Inc; Acrovyn Solid Color and Chameleon Crash Rails: www.c-sgroup.com/#sle.
 - 2. Wallprotex; wX3 Vinyl Corner Guards: www.wallprotex.com/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.

2.02 PRODUCT TYPES

- A. Corner Guards - Surface Mounted:
 - 1. Material: High impact vinyl with full height extruded aluminum retainer.
 - 2. Material: Polyethylene terephthalate (PET or PETG); PVC-free with full height extruded aluminum retainer.
 - 3. Width of Wings: 2 inches (51 mm).
 - 4. Corner: Square.
 - 5. Color: As selected from manufacturer's standard colors.
 - 6. Length: One piece.
 - 7. Preformed end caps.

2.03 FABRICATION

- A. Fabricate components with tight joints, corners and seams.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

3.02 INSTALLATION

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.
- B. Position corner guard 4 inches (102 mm) above finished floor to 36" high.

3.03 TOLERANCES

- A. Maximum Variation From Required Height: 1/4 inch (6 mm).

END OF SECTION

SECTION 102800 TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Commercial toilet accessories.
- B. Commercial shower and bath accessories.
- C. Diaper changing stations.
- D. Utility room accessories.

1.02 RELATED REQUIREMENTS

- A. Section 088300 - Mirrors: Other mirrors.
- B. Section 093000 - Tiling: Ceramic washroom accessories.
- C. Section 102113.13 - Metal Toilet Compartments.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Commercial Toilet, Shower, and Bath Accessories:
 - 1. Bradley Corporation; _____: www.bradleycorp.com/#sle.
 - 2. Kimberly-Clark Corporation; Kimberly-Clark Professional ICON Collection: www.kcprofessional.com/#sle.
 - 3. Substitutions: Section 016000 - Product Requirements.
- B. Diaper Changing Stations:
 - 1. Bradley Corporation: www.bradleycorp.com/#sle.
 - 2. Koala Kare Products: www.koalabear.com/#sle.
 - 3. Substitutions: 016000 - Product Requirements.

2.02 DIAPER CHANGING STATIONS

- A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
 - 1. Material: Polyethylene.
 - 2. Mounting: Surface.
 - 3. Color: Gray.
 - 4. Minimum Rated Load: 250 pounds (113.4 kg).
 - 5. Products:

- a. Foundations Worldwide, Inc; Classic Baby Changing Station with Stainless Frame:
www.foundations.com/#sle.
- b. Rubbermaid Commercial Products; FG781988 Baby Changing Station Vertical:
www.rubbermaidcommercial.com/#sle.
- c. Saniflow Hand Dryer Corporation; Babymedi Horizontal: www.saniflowcorp.com/#sle.

END OF SECTION

SECTION 123200 MANUFACTURED WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured standard and custom casework, with cabinet hardware.
- B. Countertops.

1.02 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate casework types, sizes, and locations, using large scale plans, elevations, and cross sections. Include rough-in and anchors and reinforcements, placement dimensions and tolerances, clearances required, and keying information.
- C. Maintenance Data: Manufacturer's recommendations for care and cleaning.
- D. Finish touch-up kit for each type and color of materials provided.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect items provided by this section, including finished surfaces and hardware items during handling and installation. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.
- B. Acceptance at Site:
 - 1. Do not deliver or install casework until the conditions specified under Part 3, Examination Article of this section have been met. Products delivered to sites that are not enclosed and/or improperly conditioned will not be accepted if warping or damage due to unsatisfactory conditions occurs.
- C. Storage:
 - 1. Store casework in the area of installation. If necessary, prior to installation, temporarily store in another area, meeting the environmental requirements specified under Part 3, "Site Verification of Conditions" Article of this section.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion, at no additional cost to Owner. Defects include, but are not limited to:
 - 1. Ruptured, cracked, or stained finish coating.
 - 2. Discoloration or lack of finish integrity.
 - 3. Cracking or peeling of finish.
 - 4. Failure of hardware.

PART 2 PRODUCTS

2.01 CASEWORK, GENERAL

- A. Quality Standard: AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.02 FABRICATION

- A. Assembly: Shop assemble casework items for delivery to site in units easily handled and to permit passage through building openings.
- B. Construction: As required for selected grade.

- C. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

2.03 ACCESSORIES

- A. Plastic Edge Banding: Extruded PVC, convex shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
 - 1. Color: As selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.01 PREPARATION

- A. Large Components: Ensure that large components can be moved into final position without damage to other construction.

3.02 INSTALLATION

- A. Perform installation in accordance with manufacturer's instructions.
- B. Use anchoring devices to suit conditions and substrate materials encountered. Use concealed fasteners to the greatest degree possible. Use exposed fasteners only where allowed by approved shop drawings, or where concealed fasteners are impracticable.
- C. Set casework items plumb and square, securely anchored to building structure.
- D. Align cabinets to adjoining components, install filler and/or scribe panels where necessary to close gaps.
- E. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch (1.6 mm). In addition, do not exceed the following tolerances:
 - 1. Variation of Tops of Base Cabinets from Level: 1/16 inch (1.6 mm) in 10 feet (3 m).
 - 2. Variation of Faces of Cabinets from a True Plane: 1/8 inch (3 mm) in 10 feet (3 m).
 - 3. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch (0.8 mm).
 - 4. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch (1.6 mm).
- F. Base Cabinets: Fasten cabinets to service space framing and/or wall substrates, with fasteners spaced not more than 16 inches (407 mm) on center. Bolt adjacent cabinets together with joints flush, tight, and uniform.
- G. Install hardware uniformly and precisely.
- H. Countertops: Install countertops intended and furnished for field installation in one true plane, with ends abutting at hairline joints, and no raised edges.
- I. Replace units that are damaged, including those that have damaged finishes.

3.03 ADJUSTING

- A. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

3.04 CLEANING

- A. See Section 017419 - Construction Waste Management and Disposal for additional requirements.
- B. Clean casework and other installed surfaces thoroughly.

3.05 PROTECTION

- A. Do not permit finished casework to be exposed to continued construction activity.
- B. Protect casework and countertops from ongoing construction activities. Prevent workmen from standing on, or storing tools and materials on casework or countertops.
- C. Repair damage, including to finishes, that occurs prior to Date of Substantial Completion, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

END OF SECTION

SECTION 283100 FIRE DETECTION AND ALARM

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. NFPA 72 - National Fire Alarm and Signaling Code; Most Recent Edition Cited by Referring Code or Reference Standard.
- D. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.02 SECTION INCLUDES:

- A. Fire alarm and smoke detection system.

1.03 REFERENCES:

- A. NFPA 13: Standard for the Installation of Sprinkler Systems.
- B. NFPA 13A: Recommended Practice for the Inspection, Testing and Maintenance of Sprinkler Systems.
- C. NFPA 70: National Electrical Code
- D. NFPA 72: Installation, Maintenance, and Use of Local Protective Signaling System.
- E. NFPA 72E: Automatic Fire Detectors.
- F. NFPA 72G: Notification Appliances for Protective Signaling Systems.
- G. NFPA 72H: Guide for Testing Procedure for Local, Auxiliary, Remote Station and Proprietary Protective Signaling Systems.
- H. NFPA 90: Standard for the Installation of Air Conditioning and Ventilating Systems.
- I. NFPA 101: Life Safety Code.

1.04 REGULATORY REQUIREMENTS:

- A. Systems: UL and FM listed.
- B. Conform to requirements of NFPA.
- C. Conform to requirements of Standard Building Code.
- D. Conform to requirements of American's with Disabilities Act - ADA.

1.05 SYSTEM REQUIREMENTS:

- A. A new addressable fire alarm control panel to be furnished. The system shall be addressable. Where applicable, the system shall include, but not be limited to the following elements.
 - 1. Master system CPU including all fire detection.
 - 2. Circuit interface panels including all modules.
 - 3. Power supplies, batteries and battery chargers.
 - 4. Equipment enclosures.
 - 5. Intelligent addressable manual pull stations, heat detectors, analog smoke detectors, alarm monitoring modules, and supervised control modules.
 - 6. Annunciator panels, printers and video display terminals.
 - 7. Audible and visual evacuation signals.
 - 8. Color graphic displays and historical archiving.
 - 9. Software and firmware as required to provide a complete functioning system.
 - 10. Wiring and raceway.

11. Installation, testing and certification and education labor.
12. Multiplex, system driven remote annunciator.

1.06 SYSTEM FUNCTION:

- A. The system shall be a complete, electrically supervised multiplex style fire detection and audio/visual evacuation system with intelligent analog alarm initiation, to be device addressable and annunciated as described and shown on the Drawings.
- B. The system shall support intelligent analog smoke detection, conventional smoke detection, manual station, water flow, supervisory, security, and status monitoring devices. The system shall also support audio/visual circuits.
- C. The panel shall be UL listed as a test instrument for the measurement of the sensitivity of connected intelligent analog ionization and photoelectric smoke detectors to comply with the testing requirements of NFPA 72E.
- D. The system shall annunciate a trouble condition when any smoke detector approaches 80% of its alarm threshold due to gradual contamination, signaling the need for service and eliminating unwanted alarms.
- E. Any intelligent analog smoke detector or conventional smoke detector zone shall include a selectable alarm verification capability. This feature shall provide automatic verification capability. This feature shall provide automatic verification of smoke detector alarms as described by NFPA 72E.
- F. The system shall recognize initiating of an alarm and indicate the alarm condition in a degrade mode of operation, in the event of processor failure or the loss of system communications to the circuit interface panels.
- G. The system shall provide a one person field test of either the complete system or a specified area, maintaining full function of areas not under test.
- H. The system shall be provided with eight levels of password protection with up to forty passwords.
- I. The system shall be programmed in the field via a laptop computer. All programmed information shall be stored in nonvolatile memory after downloading into the control panel. No special programming terminal or prom burning shall be required and the system shall continue in service during reprogramming. Systems requiring on line programming or not capable of mass uploading of software for offsite documentation or editing will not be considered acceptable.
- J. The system shall consist of central architecture using a single centrally located control unit. The system also shall be operable in a distributed multiplex architecture using a centrally located control unit with interconnection to remote circuit interface panels containing any combination of plug in intelligent analog signalling circuits, plug in conventional initiating device circuits and plug in relays.
- K. The system shall support a UL listed supervised printer.
- L. The system as installed shall be expandable to its predetermined maximum capacity of 3,000 initiation devices and/or 2,000 combined zones of audio/visual devices.

1.07 SYSTEM OPERATION:

- A. Activation of any fire alarm initiating device shall cause the following actions and indications:
 1. Display a custom message describing the device originating the alarm condition, at the fire alarm control panel LCD alpha numeric display. Remote LCD annunciators shall display the alarm condition via unique messages as required by the system Owner. LED type annunciator displays conventional and graphic style shall indicate alarm zoning as specified.
 2. Sound the audio/voice circuits, and activate the visual signals.
 3. Shut down all air handling units within the smoke zone of alarm origin.

4. Furnish an alarm system closure for connection to an off site reporting device as contracted for by the system user, via a dialer provided under this Section. THIS OPTION REQUIRED IF EXISTING SYSTEM (where applicable) IS NOT EQUIPPED TO PROVIDE THIS OPTION.
 5. Close all smoke doors and smoke dampers (if any present in facility) shown on the Drawings to prevent the spread of smoke.
 6. Record within the non-volatile system historical memory the occurrence of the event, the time and date of occurrence and the device initiating the event.
- B. WHERE APPLICABLE... Activation of any smoke detector or two cross zoned smoke detectors in a single elevator lobby or an elevator equipment room shall, besides the actions described above, cause the recall of that bank of elevators to the terminal floor and the lockout of controls. In the event of recall initiation by a detector in the first floor lobby, the recall shall be to the alternate floor.
- C. Activation of any detector in an elevator hoistway or machine room shall cause the capture of that bank of elevators per local requirements, upon completion of these actions, activate the sprinkler system pre-action release panel.
- D. Activation of any supervisory circuit, shall cause the following actions and indications:
1. Display the origin of the supervisory condition report at the alarm control panel alphanumeric LCD display.
 2. Activate supervisory audible and visual signals as indicated on the Drawings.
 3. Furnish an alarm system closure for connection to an off site reporting device as contracted for by the system user.
 4. Record the occurrence of the event, the time of occurrence and the device initiating the event.
- E. Receipt of a trouble report (primary power loss, open or grounded initiating or signalling circuit wiring, open, grounded or shorted indication system wiring, device communication failure, battery disconnect) at the fire alarm control panel shall cause the following actions and indications:
1. Display at the alarm control panel alphanumeric LCD display, the origin of the trouble condition report.
 2. Activate trouble audible and visual signals at the control panel and as indicated on the Drawings.
 3. Furnish an alarm system closure for connection to an off site reporting device as contracted for by the system user, via a Dialer furnished under this Section.
 4. Record the occurrence of the event, the time of occurrence and the device initiating the event.

1.08 SYSTEM ZONING:

- A. Each intelligent addressable device or conventional zone on the system shall be displayed at the fire alarm control panel by a unique alpha numeric label identifying its location.

1.09 QUALIFICATIONS:

- A. Manufacturer: Company specializing in smoke detection and fire alarm systems with five years experience and an office within 125 miles (201.17 kilometers) of job site.
- B. Installer: Company specializing in smoke detection and fire alarm system with three years experience.

1.10 SUBMITTALS:

- A. Submit shop Drawings and products data.
- B. Provide wiring diagrams, data sheets, and equipment ratings, layout, dimensions, and finishes. Include location of end-of-line devices.
- C. Submit manufacturer's installation instructions.

1.11 OPERATION AND MAINTENANCE DATA:

- A. Submit as-built Drawings indicating location of all devices, wiring, and end-of-line devices.
- B. Include operating instructions, and maintenance and repair procedures.
- C. Include manufacturer representative's letter stating that system is operational, and install in accordance with NFPA 72A, 72B, 72E, 72G and 101 and tested in accordance with NFPA 72H.

PART 2 PRODUCTS

2.01 MANUFACTURERS:

- A. Where new fire alarm systems are required, acceptable manufacturers are: Pyrotronics, Simplex, EST, Gamewell, Notifier, and FCI (Fire Control Instruments)

2.02 FIRE ALARM CONTROL PANEL:

- A. The control panel shall be modular in construction and shall include, but not limited to; the hardware, software and firmware required to perform system functions.
- B. The control panel shall be housed within a code gage steel enclosure flush wall mounted.
- C. System power supplies shall be housed within the enclosure. Primary power supply shall be from the building distribution system. Secondary power shall be provided by internal sealed gelled electrolyte batteries with capability to operate the system for eight (8) hours.
- D. The panel shall provide a system for maintaining a historical event record.

2.03 FIRE ALARM INITIATING DEVICES:

- A. Smoke Detector, Intelligent Ionization: The detector shall be addressable, dual chamber, self compensating for ambient temperature and humidity. Detectors shall be suitable for two wire operation.
- B. Smoke Detector, Intelligent Photoelectric: The detector shall be addressable, self compensating for ambient temperature and humidity with integral self, restoring 135 degree heat detector. Detectors shall be suitable for two wire operation.
- C. Smoke Detector, Intelligent Duct Type: The detector shall be addressable, self compensating for ambient temperature and humidity, ionization or photoelectric type as application requires.
- D. Smoke Detector, Projected Beam: The detector shall consist of an infrared light beam transmitter and a light receiver. The detector shall be self compensating for ambient and temperature changes.
- E. Thermal Detector, Intelligent: The detectors shall be addressable, rate compensated rated at 135 degrees or 200 degrees Fahrenheit. Detectors shall be suitable for two wire operation.
- F. Manual Pull Station, Intelligent: The pull station shall be addressable single station type. Pull stations shall be flush wall mounted.

2.04 ZONE AND INTERFACE MODULES:

- A. Remote Conventional Zone Module: Provide, for integration of compatible 2 wire and shorting style contact devices into the analog signaling circuit.
- B. Intelligent System Interface Module: Furnish and install, for the monitoring of contact type initiation devices and for the control of electrical devices where required.
- C. Intelligent Supervised Control Module: Furnish and install for the control of supervised relays, contractors, audible signal circuits, visual signal circuits, distributed speaker circuits and two way fire fighters communication circuits.

2.05 EVACUATION/SIGNALLING DEVICES:

- A. Evacuation Horn(Speaker)/Strobe. Provide audible horns with strobe as indicated on the Drawings. Integral strobe shall be flashing, polarized type with polycarbonate lens producing 8000 peak candlepower at one flash per second.

- B. Evacuation Strobe: Provide visual evacuation strobes at locations indicated on the Drawings. Strobes shall be flush wall mounted, flashing, polarized type with polycarbonate lens producing 8000 peak candlepower at one flash per second.

2.06 FIRE ALARM WIRE AND CABLE:

- A. Fire Alarm Power Circuits: Building wire as specified in Section 16300. Minimum size conductors shall be 12 AWG.
- B. Fire Alarm Loop Circuits: Analog loop circuits shall be 18 AWG twisted pair.
- C. Fire Alarm Speaker Circuits: Speaker circuits shall be 18 AWG twisted pair.
- D. Fire Alarm Initiating and Strobe Circuits: Circuits shall be minimum 14 AWG building wire as specified in Section 16300.

2.07 2.07 DIALER: PROVIDE DIALER FOR OFF SITE NOTIFICATION WHERE REQUIRED LOCALLY. IF EXISTING SYSTEM, VERIFY IF EXISTING SYSTEM IS EQUIPPED WITH THE LOCAL REQUIREMENT.

PART 3 EXECUTION

3.01 INSTALLATION:

- A. Install system in accordance with manufacturer's instructions.
- B. Install manual station with operating handle 48 inches (1219.2 mm) above floor. Install audible and visual devices 80 inches (2032 mm) above floor or as indicated.
- C. Install cables and wiring in conduit.
- D. Mount end-of-line device in control panel or in box with last device or separate box adjacent to last device
 - 1. in circuit.
- E. Make conduit and wiring connections to sprinkler flow switches, sprinkler valve tamper switches, duct smoke detectors, HVAC shutdown equipment, and elevator control equipment.
- F. Automatic Detector Installation: NFPA 72E.
- G. Provide surge suppression for all wiring of the fire alarm system.

3.02 FIELD QUALITY CONTROL:

- A. Field inspection and testing will be performed.
- B. Test in accordance with NFPA 72H and local fire department requirements.

3.03 MANUFACTURER'S FIELD SERVICES:

- A. Provide manufacturer's field services as required for installation.
- B. Include services of certified technician to supervise installation, adjustments, final connections, and system testing.
- C. Instruct Owner in operation and function of the system.

END OF SECTION 28 31 00

- 1. THIS PAGE INTENTIONALLY LEFT BLANK

END OF SECTION

SECTION 323313 SITE BICYCLE RACKS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Bicycle racks.
- B. Related Requirements:
 - 1. Section 033000 - Cast-in-Place Concrete: Platform for supporting bicycle racks.

1.02 SUBMITTALS

- A. Submittals for this Section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
- B. Manufacturer's installation instructions shall be provided along with product data.
- C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
- D. Product Data: Submit physical characteristics including shape, dimensions, bicycle parking capacity, and finish for each bicycle rack.
- E. Shop Drawings: Indicate installation details for each bicycle rack.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
- H. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and installer.
- I. Project Record Documents: Record actual locations of bicycle racks.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Store materials according to manufacturer instructions.
- C. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.04 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

PART 2 PRODUCTS

2.01 BICYCLE RACKS

- A. Manufacturers:
 - 1. Madrax, 1080 Uniek Drive, Waunakee, WI 53597, (800)448-7931.
 - 2. Approved equivalent.
- B. Description:
 - 1. Number of Bicycles Parked per Unit: 2 units with 4 racks each see site plan.
 - 2. Style:
 - a. Freestanding.
 - b. Inverted U.

- C. Tubes:
 - 1. Material: Schedule 40 steel.
 - 2. Configuration: Round.
- D. Finish: Hot-dip galvanized after fabrication.
- E. Accessories:

2.02 SUSTAINABILITY CHARACTERISTICS

- A. Material and Resource Characteristics:
 - 1. Recycled Content Materials: Furnish materials with maximum available recycled content including:

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that items provided by other Sections of Work are ready to receive Work of this Section.

3.02 INSTALLATION

- A. According to manufacturer instructions and as indicated on Drawings.

END OF SECTION

PART 03 PLUMBING SPECIFICATIONS (WATFORD)

SECTION 220100 - PLUMBING GENERAL

1 GENERAL

1.1 The work covered by this division consists of providing all labor, equipment and materials and performing all operations necessary for the installation of the plumbing work as herein called for and shown on the drawings.

1.2 Related Documents:

1.2.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2.2 This is a Basic Plumbing Requirements Section. Provisions of this section apply to work of all Division-22 sections. Provisions of Division-23 Basic Mechanical Requirements Sections apply to work of all Division-22 sections.

1.2.3 Review all other contract documents to be aware of conditions affecting work herein.

1.2.4 Definitions:

1.2.4.1 Provide: Furnish and install, complete and ready for intended use.

1.2.4.2 Furnish: Supply and deliver to project site, ready for subsequent requirements.

1.2.4.3 Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.

1.3 Permits and Fees: Contractor shall obtain all necessary permits, meters, and inspections required for his work and pay all fees and charges incidental thereto.

1.4 Verification of Owner's Data: Prior to commencing any work the Contractor shall satisfy himself as to the accuracy of all data as indicated in these plans and specifications and/or as provided by the Owner. Should the Contractor discover any inaccuracies, errors, or omissions in the data, he shall immediately notify the Architect/Engineer in order that proper adjustments can be anticipated and ordered. Commencement by the Contractor of any work shall be held as an acceptance of the data by him after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions or inaccuracies of the said data.

1.5 Delivery and Storage of Materials: Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. All material shall be stored to provide protection from the weather and accidental damage.

1.6 Extent of work is indicated by the drawings, schedules, and the requirements of the specifications. Singular references shall not be constructed as requiring only one device if multiple devices are shown on the drawings or are required for proper system operation.

1.7 Field Measurements and Coordination:

- 1.7.1 The intent of the drawings and specifications is to obtain a complete and satisfactory installation. Separate divisional drawings and specifications shall not relieve the Contractor or subcontractors from full compliance of work of his trade indicated on any of the drawings or in any section of the specifications.
- 1.7.2 Verify all field dimensions and locations of equipment to insure close, neat fit with other trades' work. Make use of all contract documents and approved shop drawings to verify exact dimension and locations.
- 1.7.3 Coordinate work in this division with all other trades in proper sequence to ensure that the total work is completed within contract time schedule and with a minimum cutting and patching.
- 1.7.4 Locate all apparatus symmetrical with architectural elements. Install to exact height and locations when shown on architectural drawings. When locations are shown only on plumbing drawings, be guided by architectural details and conditions existing at job and correlate this work with that of others.
- 1.7.5 Install work as required to fit structure, avoid obstructions, and retain clearance, headroom, openings and passageways. Cut no structural members without written approval.
- 1.7.6 Carefully examine any existing conditions, piping, and premises. Compare drawings with existing conditions. Report any observed discrepancies. It shall be the Contractor's responsibility to properly coordinate the work and to identify problems in a timely manner. Written instructions will be issued to resolve discrepancies.
- 1.7.7 Because of the small scale of the drawings, it is not possible to indicate all offsets and fittings or to locate every accessory. Drawings are essentially diagrammatic. Study carefully the sizes and locations of structural members, wall and partition locations, trusses, and room dimensions and take actual measurements on the job. Locate piping, ductwork, equipment and accessories with sufficient space for installing and servicing. Contractor is responsible for accuracy of his measurements and for coordination with all trades. Contractor shall not order materials or perform work without such verification. No extra compensation will be allowed because field measurements vary from the dimensions on the drawings. If field measurements show that equipment or piping cannot be fitted, the Architect/Engineer shall be consulted. Remove and relocate, without additional compensation, any item that is installed and is later found to encroach on space assigned to another use.
- 1.8 Guarantee:
 - 1.8.1 The Contractor shall guarantee labor, materials and equipment for a period of one (1) year from Final Completion, or from Owner's occupancy, whichever is earlier. Contractor shall make good any defects and shall include all necessary adjustments to and replacement of defective items without expense to the Owner.
 - 1.8.2 Owner reserves right to make emergency repairs as required to keep equipment in operation without voiding Contractor's Guarantee Bond nor relieving Contractor of his responsibilities during guarantee period.
- 1.9 Approval Submittals:

- 1.9.1 When approved, the submittal control log and submittals shall be an addition to the specifications herewith, and shall be of equal force in that no deviation will be permitted except with the approval of the Architect/Engineer.
 - 1.9.1.1 Shop drawings, product literature, and other approval submittals will only be reviewed if they are submitted in full accordance with the General and Supplementary Conditions and Division 1 Specification sections and the following.
 - 1.9.1.1.1 Submittals shall be properly organized in accordance with the approved submittal control log.
 - 1.9.1.1.2 Submittals shall not include items from more than one specification section in the same submittal package unless approved in the submittal control log.
 - 1.9.1.1.3 Submittals shall be properly identified by a cover sheet showing the project name, Architect and Engineer names, submittal control number, specification section, a list of products or item names with model numbers in the order they appear in the package, and spaces for approval stamps. A sample cover sheet is included at the end of this section.
 - 1.9.1.1.4 Submittals shall have been reviewed and approved by the General Contractor (or Prime Contractor). Evidence of this review and approval shall be an "Approved" stamp with a signature and date on the cover sheet.
 - 1.9.1.1.5 Submittals that include a series of fixtures or devices (such as plumbing fixtures or valves) shall be organized by the fixture number or valve type and be marked accordingly. Each fixture must include all items associated with that fixture regardless of whether or not those items are used on other fixtures.
 - 1.9.1.1.6 The electrical design shown on the drawings supports the plumbing equipment basis of design specifications at the time of design. If plumbing equipment is submitted with different electrical requirements, it is the responsibility of the plumbing contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the plumbing submittal with a written statement that this change will be provided at no additional cost. Plumbing submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost.
- 1.9.2 If the shop drawings show variation from the requirements of contract because of standard shop practice or other reasons, the Contractor shall make specific mention of such variation in writing in his letter of transmittal and on the submittal cover sheet in order that, if acceptable, Contractor will not be relieved of the responsibility for executing the work in accordance with the contract.
- 1.9.3 Review of shop drawings, product literature, catalog data, or schedules shall not relieve the Contractor from responsibility for deviations from contract drawings or specifications, unless he has in writing called to the attention of the Architect/Engineer each such deviation in writing at the time of submission, nor shall it relieve him from responsibility for errors of any sort in shop drawings, product literature, catalog data, or schedules. Any feature or function specified but not mentioned in the submittal shall be assumed to be included per the specification.
- 1.9.4 Submit shop drawings as called for in other sections after award of the contract and before any material is ordered or fabricated. Shop drawings shall consist of plans, sections, elevations and details

to scale (not smaller than ¼" per foot), with dimensions clearly showing the installation. Direct copies of small scale project drawings issued to the Contractor are not acceptable. Drawings shall take into account equipment furnished under other sections and shall show space allotted for it. Include construction details and materials.

- 1.10 Test Reports and Verification Submittals: Submit test reports, certifications and verification letters as called for in other sections. Contractor shall coordinate the required testing and documentation of system performance such that sufficient time exists to prepare the reports, submit the reports, review the reports and take corrective action within the scheduled contract time.
- 1.11 O&M Data Submittals: Submit Operation and Maintenance data as called for in other sections. When a copy of approval submittals is included in the O&M Manual, only the final "Approved" or "Approved as Noted" copy shall be used. Contractor shall organize these data in the O&M Manuals tabbed by specification number. Prepare O&M Manuals as required by Division 1 and as described herein. Submit manuals at the Substantial Completion inspection.

2 PRODUCTS

- 2.1 All materials shall be new or Owner-supplied reused as shown on the drawings, the best of their respective kinds, suitable for the conditions and duties imposed on them at the building and shall be of reputable manufacturers. The description, characteristics, and requirements of materials to be used shall be in accordance with qualifying conditions established in the following sections.
- 2.2 Equipment and Materials:
- 2.2.1 Shall be new and the most suitable grade for the purpose intended. Equipment furnished under this division shall be the product of a manufacturer regularly engaged in the manufacture of such items for a period of three years. Where practical, all of the components shall be products of a single manufacturer in order to provide proper coordination and responsibility. Where required, Contractor shall furnish proof of installation of similar units or equipment.
- 2.2.2 Each item of equipment shall bear a name plate showing the manufacturer's name, trade name, model number, serial number, ratings and other information necessary to fully identify it. This plate shall be permanently mounted in a prominent location and shall not be concealed, insulated or painted.
- 2.2.3 The label of the approving agency, such as UL, IBR, ASME, ARI, AMCA, by which a standard has been established for the particular item shall be in full view.
- 2.2.4 The equipment shall be essentially the standard product of a manufacturer regularly engaged in the production of such equipment and shall be a product of the manufacturer's latest design.
- 2.2.5 A service organization with personnel and spare parts shall be available within two hours for each type of equipment furnished.
- 2.2.6 Install in accordance with manufacturer's recommendations. Place in service by a factory trained representative where required.
- 2.2.7 Materials and equipment are specified herein by a single or by multiple manufacturers to indicate quality, material and type of construction desired. Manufacturer's products shown on the drawings have been used as basis for design; it shall be the Contractor's responsibility to ascertain that alternate

manufacturer's products, or the particular products of named manufacturers, meet the detailed specifications and that size and arrangement of equipment are suitable for installation.

- 2.2.8 Model Numbers: Catalog numbers and model numbers indicated in the drawings and specifications are used as a guide in the selection of the equipment and are only listed for the contractor's convenience. The contractor shall determine the actual model numbers for ordering materials in accordance with the written description of each item and with the intent of the drawings and specifications.

2.3 Requests for Substitution:

- 2.3.1 Where a particular system, product or material is specified by name, consider it as standard basis for bidding, and base proposal on the particular system, product or material specified.

- 2.3.2 Requests by Contractor for substitution will be considered only when reasonable, timely, fully documented, and qualifying under one or more of the following circumstances.

- 2.3.2.1 Required product cannot be supplied in time for compliance with Contract time requirements.

- 2.3.2.2 Required product is not acceptable to governing authority, or determined to be non-compatible, or cannot be properly coordinated, warranted or insured, or has other recognized disability as certified by Contractor.

- 2.3.2.3 Substantial cost advantage is offered Owner after deducting offsetting disadvantages including delays, additional compensation for redesign, investigation, evaluation and other necessary services and similar considerations.

- 2.3.3 All requests for substitution shall contain a "Comparison Schedule" and clearly and specifically indicate any and all differences or omissions between the product specified as the basis of design and the product proposed for substitution. Differences shall include but shall not be limited to data as follows for both the specified and substituted products:

Principal of operation.

Materials of construction or finishes.

Thickness of gauge of materials.

Weight of item.

Deleted features or items.

Added features or items.

Changes in other work caused by the substitution.

Performance curves.

If the approved substitution contains differences or omissions not specifically called to the attention of the Architect/Engineer, the Owner reserves the right to require equal or similar features to be added to the substituted products (or to have the substituted products replaced) at the Contractor's expense.

3 EXECUTION

- 3.1 Workmanship: All materials and equipment shall be installed and completed in a first-class workmanlike manner and in accordance with the best modern methods and practice. Any materials installed which do not present an orderly and reasonably neat and/or workmanlike appearance, or do

not allow adequate space for maintenance, shall be removed and replaced when so directed by the Architect/Engineer.

3.2 Coordination:

3.2.1 The Contractor shall be responsible for full coordination of the plumbing systems with shop drawings of the building construction so the proper openings and sleeves or supports are provided for piping, ductwork, or other equipment passing through slabs or walls.

3.2.2 Any additional steel supports required for the installation of any plumbing equipment, piping, or ductwork shall be furnished and installed under the section of the specifications requiring the additional supports.

3.2.3 It shall be the Contractor's responsibility to see that all equipment such as valves, dampers, filters and such other apparatus or equipment that may require maintenance and operation are made easily accessible, regardless of the diagrammatic location shown on the drawings.

3.2.4 All connections to fixtures and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.

3.2.5 The contractor shall protect equipment, material, and fixtures at all times. He shall replace all equipment, material, and fixtures which are damaged as a result of inadequate protection.

3.2.6 Prior to starting and during progress of work, examine work and materials installed by others as they apply to work in this division. Report conditions which will prevent satisfactory installation.

3.2.7 Start of work will be construed as acceptance of suitability of work of others.

3.3 Interruption of Service: Before any equipment is shut down for disconnecting or tie-ins, arrangements shall be made with the Architect/Engineer and this work shall be done at the time best suited to the Owner. This will typically be on weekends and/or holidays and/or after normal working hours. Services shall be restored the same day unless prior arrangements are made. All overtime or premium costs associated with this work shall be included in the base bid.

3.4 Phasing: Provide all required temporary valves, piping, ductwork, equipment and devices as required. Maintain temporary services to areas as required. Remove all temporary material and equipment on completion of work unless Engineer concurs that such material and equipment would be beneficial to the Owner on a permanent basis.

3.5 Cutting and Patching: Notify General Contractor to do all cutting and patching of all holes, chases, sleeves, and other openings required for installation of equipment furnished and installed under this section. Utilize experienced trades for cutting and patching. Obtain permission from Architect/Engineer before cutting any structural items.

3.6 Equipment Setting: Bolt equipment directly to concrete pads or vibration isolators as required, using hot-dipped galvanized anchor bolts, nuts and washers. Level equipment.

3.7 Painting: Touch-up factory finishes on equipment located inside and outside shall be done under Division 22. Obtain matched color coatings from the manufacturer and apply as directed. If

corrosion is found during inspection on the surface of any equipment, clean, prime, and paint, as required.

3.8 Clean-up: Thoroughly clean all exposed parts of apparatus and equipment of cement, plaster, and other materials and remove all oil and grease spots. Repaint or touch up as required to look like new. During progress of work, contractor is to carefully clean up and leave premises and all portions of building free from debris and in a clean and safe condition.

3.9 Start-up and Operational Test: Start each item of equipment in strict accordance with the manufacturer's instructions; or where noted under equipment specification, start-up shall be done by a qualified representative of the manufacturer. Alignment, lubrication, safety, and operating control shall be included in start-up check.

3.10 Record Drawings:

3.10.1 During the progress of the work the Contractor shall record on their field set of drawings the exact location, as installed, of all piping, ductwork, equipment, and other systems which are not installed exactly as shown on the contract drawings.

3.10.2 Upon completion of the work, record drawings shall be prepared as described in the General Conditions, Supplementary Conditions, and Division 1 sections.

3.11 Acceptance:

3.11.1 Punch List: Submit written confirmation that all punch lists have been checked and the required work completed.

3.11.2 Instructions: At completion of the work, provide a competent and experienced person who is thoroughly familiar with project, for one day to instruct permanent operating personnel in operation of equipment and control systems. This is in addition to any specific equipment operation and maintenance training.

3.11.3 Operation and Maintenance Manuals: Furnish four complete manuals bound in ring binders with Table of Contents, organized, and tabbed by specification section. Manuals shall contain:

Detailed operating instructions and instructions for making minor adjustments.

Complete wiring and control diagrams.

Routine maintenance operations.

Manufacturer's catalog data, service instructions, and parts lists for each piece of operating equipment.

Copies of approved submittals.

Copies of all manufacturer's warranties.

Copies of test reports and verification submittals

3.11.4 Closeout Documents: The following closeout documents must be completed and submitted to engineer prior to occupancy of the building. Provide written confirmation to engineer that these have been completed and submitted:

STATEMENT DESCRIBING PLUMBING SCOPE OF WORK
PLUMBING CONTRACTOR'S WARRANTY LETTER

PLUMBING EQUIPMENT WARRANTY DOCUMENTS
PLUMBING OPERATIONS & MAINTENANCE MANUAL
PLUMBING EQUIPMENT STARTUP REPORTS
AS-BUILT OF PLUMBING DRAWINGS
PLUMBING TRAINING DOCUMENTS & SIGN-IN SHEET
CERTIFICATION OF WATER SYSTEM DISINFECTION
RECORD OF APPROVED PLUMBING SUBMITTALS

3.11.5 Record Drawings: Submit record drawings.

END OF SECTION 220100

SECTION 220700 - INSULATION FOR PLUMBING EQUIPMENT AND PIPING

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-22 Basic Plumbing Materials and Methods Sections apply to work of this section.
- 1.3 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.
- 1.4 Approval Submittals:
 - 1.4.1 Product Data: Submit a producer's data sheets and installation instructions on each insulation system including insulation, coverings, adhesives, sealers, protective finishes, and other material recommended by the manufacturer for applications indicated. Submit for:

Fiberglass pipe insulation
- 1.5 O&M Data Submittals: Submit a copy of all approval submittals. Include in O&M Manual.

2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide insulation products by Armstrong, Johns Manville, Knauf, Owens Corning, Pittsburgh Corning, U.S. Rubber, or approved equal. All products shall be asbestos-free.
- 2.2 Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics, and adhesive) with a flame-spread rating of 25 or less, and a smoke-developed rating of 50 or less, as tested by ANSI/ASTM E84.
- 2.3 Pipe Insulation Materials:
 - 2.3.1 Fiberglass Pipe Insulation: ASTM C547, Class 1 unless otherwise indicated. (Preformed sleeving with white all-service jacket, suitable for temperatures up to 450°F)
 - 2.3.2 Staples, Bands, Wires, and Cement: As recommended by the insulation manufacturer for applications indicated.
 - 2.3.3 Adhesives, Sealers, Protective Finishes: Products recommended by the insulation manufacturer for the application indicated.
 - 2.3.4 Jackets: ASTM C921, Type I (vapor barrier) for piping below ambient temperature, Type II (vapor permeable) for piping above ambient temperature. Type I may be used for all piping at Installer's option.

3 EXECUTION

- 3.1 General:

- 3.1.1 Install thermal insulation products in accordance with manufacturer's written instructions, and in compliance with recognized industry practices to ensure that insulation serves intended purpose.
- 3.1.2 Install insulation materials with smooth and even surfaces and on clean and dry surfaces. Redo poorly fitted joints. Do not use mastic or joint sealer as filler for gapping joints and excessive voids resulting from poor workmanship.
- 3.1.3 Maintain integrity of vapor-barrier on insulation and protect it to prevent puncture and other damage. Label all insulation "ASBESTOS FREE".
- 3.1.4 Do not apply insulation to surfaces while they are hot or wet.
- 3.1.5 Do not install insulation until systems have been checked and found free of leaks. Surfaces shall be clean and dry before attempting to apply insulation. A professional insulator with adequate experience and ability shall install insulation.
- 3.1.6 Do not install insulation on pipe systems until acceptance tests have been completed except for flexible unicellular insulation. Do not install insulation until the building is "dried-in".
- 3.2 Fiberglass Pipe Insulation:
- 3.2.1 Insulate the following piping systems (indoor locations):
- 3.2.1.1 Domestic hot water greater than 140°, less than 180° F: up to 2" pipe - 1½" thick, over 2" pipe 2" thick.
- 3.2.1.2 Domestic hot and tempered water and hot water return less than 140° F: up to 3" pipe - 1½" thick, over 3" pipe - 2" thick.
- 3.2.2 Apply insulation to pipe with all side and end joints butted tightly. Seal longitudinal lap by pressurizing with plastic sealing tool. Apply 3 inch wide self sealing butt strips to joints between insulation sections. Insulate all fittings, flanges, valves and strainers with premolded insulation. Apply coat of insulating cement to fittings and wrap with glass cloth overlapping each wrap 1" and adjacent pipe 2". Finish with heavy coat of general purpose mastic. Premolded PVC covers may also be used, but no flexible inserts are allowed.
- 3.2.3 Provide hanger or pipe support shields of 16 gauge (minimum) galvanized steel over the insulation which extends halfway up the pipe insulation cover and at least 6" on each side of the hanger.
- 3.2.4 Omit insulation on exposed plumbing fixture runouts from faces of wall or floor to fixture; on unions, flanges, strainer blowoffs, flexible connections and expansion joints.

END OF SECTION 220700

SECTION 221113 – POTABLE WATER SYSTEM

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-22 Basic Plumbing Requirements and Basic Plumbing Materials and Methods sections apply to work of this section.
- 1.3 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.
- 1.4 Extent of potable water systems work, is indicated on drawings and schedules, and by requirements of this section.
- 1.5 Refer to appropriate Division-2 sections for exterior potable water system; not work of this section unless noted.
- 1.6 Insulation for potable water piping is specified in other Division-22 sections, and is included as work of this section. Insulation requirements include:
 - 1.6.1 Domestic hot water and hot water return piping
 - 1.6.2 Domestic cold water piping outside the building envelope
- 1.7 Excavation and backfill required in conjunction with water piping is specified in other Division-23 sections, and is included as work of this section.
- 1.8 Code Compliance: Comply with applicable portions of Florida Building Code-Plumbing pertaining to selection and installation of plumbing materials and products. Comply with local utility requirements.
- 1.9 Approval Submittals:
 - 1.9.1 Product Data: Submit manufacturer's technical product data and installation instructions for:
 - Valves
 - Strainers
 - Hose bibbs
 - Wall hydrants
 - Water hammer arresters
 - Meters and gauges
 - Relief valves
 - Trap primers
 - Access doors
- 1.10 Test Reports and Verification Submittals:
 - 1.10.1 Disinfection: Submit report by Health Department.
 - 1.10.2
- 1.11 O&M Data Submittals: Submit a copy of all approval submittals. Submit maintenance data and parts

lists for valves, trap primers. Include these data in O&M manual.

2 PRODUCTS

- 2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with Florida Building Code-Plumbing where applicable. Provide sizes and types matching pipe materials used in potable water systems. Where more than one type of materials or products is indicated, selection is Installer's option.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following listed for each item.
- 2.3 Identification: Provide identification complying with Division-23 Basic Mechanical Materials and Methods section "Mechanical Identification". Provide manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct burial service; not less than 6" wide x 4 mils thick. Provide blue tape with black printing reading "CAUTION WATER LINE BURIED BELOW".
- 2.4 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-23 Basic Plumbing Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:
- 2.4.1 Interior Water Piping:
- 2.4.1.1 Above Grade: Copper tube; Type L, hard-drawn temper; wrought-copper fittings, solder-joints.
- 2.4.1.2 Below Grade: Copper tube; Type L, soft-annealed temper; no joints below floor.
- 2.4.2 Exterior Water Piping:
- 2.4.2.1 Copper tube; Type L, hard-drawn temper; wrought-copper fittings, solder-joints.
- 2.4.3 Solder joints shall be made with 95-5 solder.
- 2.5 Piping Specialties: Provide piping specialties complying with Division-23 Basic Mechanical Materials and Methods section "Piping Specialties".
- 2.6 Supports and Anchors: Provide supports and anchors complying with Division-23 Basic Mechanical Materials and Methods section "Supports and Anchors".
- 2.7 Interior Valves: Provide valves complying with Division-23 Basic Mechanical Materials and Methods section "Valves", in accordance with the following listing:
- 2.7.1 Sectional and Shutoff Valves: GA1, GA2, GA3, BA1, BA2.
- 2.7.2 Drain Valves: GA1, GA2, BA1, BA2.
- 2.7.3 Throttling Valves: BA1, BA2.

2.7.4 Check Valves: CK1, CK2, CK3.

2.8 Hose Bibbs: Provide rough nickel plated hose bibbs with lock shield compression stop and loose key removable handle, solid flange, female connection with ¾" male threaded hose end, and straight line type non-removable vacuum breaker with ¾" male threaded hose end. Acorn 8121 RCP or equal model by Woodford or Zurn.

2.9 Wall Hydrants: Provide complete bronze body hose bibbs inside stainless steel box with hinged access door with cylinder lock and "WATER" stamped on cover. Provide with vacuum breaker. Provide key operated control valve with all bronze interior parts, replaceable seat washer, screwdriver operated stop valve in supply, and ¾" male threaded hose connection. Zurn Z1350 or equal by Acorn or Woodford.

2.10 Water Hammer Arresters: Provide bellows type water hammer arresters, stainless steel casing and bellows, pressure rated for 250 psi, tested and certified in accordance with PDI Standard WH-201. Precision Plumbing Products, Josam, Zurn, Amtrol, Wade, Jay R. Smith, or approved equal.

2.11 Meters and Gauges: Provide meters and gauges complying with Division-22 Basic Plumbing Materials and Methods section "Meters and Gauges", in accordance with the following listing:

Thermometers
Pressure gauges
Calibrated balancing cocks

2.12 Combined Pressure-Temperature Relief Valves: Provide relief valves as indicated, of size and capacity as selected by Installer for proper relieving capacity, in accordance with ASME Boiler and Pressure Vessel Code. Provide bronze body, test lever and thermostat complying with ANSI Z21.22 listing requirements for temperature discharge capacity. Provide temperature relief at 210°F, and pressure relief at 150 psi. Watts, Cash, Zurn, or approved equal.

2.13 Trap Primers: Provide brass trap primers and distribution units to seal floor drains indicated on drawings. Trap primer valves shall be automatic, self contained type with no springs or diaphragms and shall not require adjustment. Trap primer valves shall be the type that can be installed anywhere on cold water piping. Distribution units shall supply 1-4 floor drains. Trap primer valves shall comply with ASSE 1018. Precision Plumbing Products PR-500, or approved equal. Where P-trap primers are indicated use "Prime-Eze" by Jay R. Smith, or approved equal. Refer to plumbing drawings for locations.

2.14 Access Doors: Provide access doors to service all valves and other devices as required in accordance with Division-23 Basic Mechanical Materials and Methods Section "Access Doors".

3 EXECUTION

3.1 General: Examine areas and conditions under which potable water systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 Install plumbing identification in accordance with Division-23 Basic Mechanical Materials and Methods section "Mechanical Identification". Install underground plastic pipe markers during backfill, 6"-8" below grade.

- 3.3 Install water distribution piping in accordance with Division-23 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings".
- 3.3.1 Install piping with 1/32" per foot (¼%) downward slope towards drain point.
- 3.3.2 Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.
- 3.4 Install piping specialties in accordance with Division-23 Basic Mechanical Materials and Methods section "Piping Specialties".
- 3.5 Install supports and anchors in accordance with Division-23 Basic Mechanical Materials and Methods section "Supports and Anchors".
- 3.6 Install valves in accordance with Division-23 Basic Mechanical Materials and Methods section "Valves".
- 3.6.1 Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves two or more plumbing fixtures or equipment connections, and elsewhere as indicated.
- 3.6.2 Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated.
- 3.6.3 Drain Valves: Install on each plumbing equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain potable water system.
- 3.6.4 Check Valves: Install where indicated.
- 3.7 Hose Bibbs and Wall Hydrants: Install on concealed piping where indicated with vacuum breaker. Mount 18 inches above grade or finished floor.
- 3.8 Install meters and gauges in accordance with Division-23 Basic Mechanical Materials and Methods section "Meters and Gauges".
- 3.9 Install relief valves on each water heater, and where indicated in accordance with the manufacturer's instructions. Pipe full size outside or to floor drain. Cut the end of the pipe at a 45° angle and terminate 6 inches above the floor or grade.
- 3.10 Piping Runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated, but in no case smaller than required by Florida Building Code-Plumbing.
- 3.11 Plumbing Equipment Connections: Connect hot and cold water piping system to plumbing equipment as indicated, and comply with equipment manufacturer's installation instructions. Provide shutoff valve and union for each connection, provide drain valve on drain connection.
- 3.12 Install water hammer arresters in upright position, in locations and of sizes indicated in accordance with PDI Standard WH-201.

- 3.13 Install trap primers as indicated, and in accordance with manufacturer's installation instructions. Provide access panels to all trap primers unless accessible through a lay-in ceiling or inside mechanical room.
- 3.14 Locate and coordinate installation of access doors for all valves and devices in accordance with Division-23 Basic Mechanical Materials and Methods section "Access Doors".
- 3.15 Piping Tests: Test, clean, and sterilize potable water piping in accordance with testing requirements of Division-23 Basic Mechanical Materials and Methods section "Testing, Cleaning, and Sterilization of Piping Systems".

END OF SECTION 221113

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 221316 - SOIL, WASTE AND VENT SYSTEM

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-22 Basic Plumbing Requirements and Basic Plumbing Materials and Methods sections apply to work of this section.
- 1.3 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.
- 1.4 Extent of soil waste and vent systems work is indicated on drawings and schedules, and by requirements of this section.
- 1.5 Refer to appropriate Division-2 sections for exterior sanitary sewer system required in conjunction with soil and waste systems; not work of this section.
- 1.6 Excavation and backfill required in conjunction with soil, waste and vent piping is specified in other Division-23 sections and is included as work of this section.
- 1.7 Refer to Division-7 section "Flashing and Sheet Metal" for flashings required in conjunction with soil and waste systems; not work of this section.
- 1.8 Code Compliance: Comply with applicable portions of Florida Building Code-Plumbing pertaining to plumbing materials, construction and installation of products. Comply with local utility requirements.
- 1.9 Approval Submittals:
 - 1.9.1 Product Data: Submit manufacturer's technical product data for:

Cleanouts
Floor drains

2 PRODUCTS

- 2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in soil and waste systems. Where more than one type of materials or products is indicated, selection is Installer's option.

Underground-Type Plastic Line Marker: Manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide green tape with black printing reading "CAUTION SEWER LINE BURIED BELOW".
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following listed for each item.
- 2.3 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-23 Basic Mechanical

Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:

2.3.1 Above Ground Soil, Waste, and Vent Piping:

2.3.1.1 Polyvinyl chloride plastic pipe (PVC); Type DWV; PVC plastic type DWV socket-type fitting, solvent cement joints. Do not use in fire-rated assemblies or return air plenums.

2.3.2 Underground Building Drain Piping (within 5 feet of the building):

2.3.2.1 Pipe Size 6" and Smaller: Polyvinyl chloride sewer pipe (PVC); Type DWV; PVC plastic type DWV socket-type.

2.4 Pipe Specialties: Provide piping specialties complying with Division-23 Basic Mechanical Materials and Methods section "Piping Specialties".

2.5 Supports and Anchors: Provide supports and anchors complying with Division-23 Basic Mechanical Materials and Methods section "Supports and Anchors".

2.6 Cleanouts: Provide factory-fabricated drainage piping products of size and type indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements and governing regulations. Josam, Jay R. Smith, Wade, Zurn.

2.6.1 Cleanout Plugs: Cast-bronze or brass, threads complying with ANSI B2.1 countersunk head.

2.6.2 Cleanout for PVC Systems:

2.6.2.1 Floor Cleanouts: Cast-iron body with adjustable head, brass plug, and scoriated nick-brass cover. Furnish with carpet flange for carpeted floors. Furnish with recessed cover for tile floors. Furnish with clamping ring for floors with membrane. Wade W-6030 hub outlet for push-on.

2.6.2.2 Cleanouts in Piping: PVC cleanout adaptor with threaded PVC plug.

2.6.2.3 Wall Cleanouts: PVC cleanout adaptor with tapped, countersunk, threaded brass plug. Square 9"x9" wall access cover, with scoriated nickel bronze finish.

2.6.2.4 Grade Cleanouts: PVC cleanout adaptor with countersunk, threaded brass plug. Wade W-8590-D plug. In sidewalks and other finished concrete, provide access cover frames with a non-tilting tractor cover. Wade W-7035-Z or equal.

2.6.2.5 Cleanouts in Paved Areas: Cast iron body, adjustable housing, ferrule with plug and round loose scoriated tractor cover. Wade W-8300-MF. Coordinate concrete depth at site with adjustable flange.

2.7 Floor Drains: Provide floor drains of size as indicated on drawings; and type, including features, as specified herein. Josam, Jay R. Smith, Wade, Zurn.

2.7.1 Floor Drains: Provide inside caulk bottom outlet or TY-Seal hub outlet with adaptor for cast iron trap installation and a 4" deep trap seal. Provide clamping rings for floors with membrane.

2.7.2 Strainer: Provide 5" satin-nickel bronze strainer.

2.7.3 Trap Primer Connection: Provide ½" trap primer tapping.

2.7.4 Funnel: Provide funnel where shown on the drawings.

2.7.5 Basis of Design: Zurn Z-415B-P.

3 EXECUTION

3.1 Examine substrates and conditions under which soil and waste systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 Piping Installation:

3.2.1 Install above grade soil and waste piping in accordance with Division-22 Basic Plumbing Materials and Methods section "Pipes and Pipe Fittings", and with Florida Building Code-Plumbing.

3.2.2 Install underground soil and waste pipes as indicated and in accordance with Florida Building Code-Plumbing. Lay underground piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install required gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements. Clean interior of piping of dirt and other superfluous material as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. Place plugs in ends of uncompleted piping at end of day or whenever work stops.

3.2.3 Install building soil and vent piping pitched to drain at minimum slope of ¼" per foot (2%) for piping smaller than 3", and 1/8" per foot (1%) for piping 3" and larger.

3.3 Install piping specialties in accordance with Division-23 Basic Mechanical Materials and Methods section "Piping Specialties".

3.4 Install supports and anchors in accordance with Division-23 Basic Mechanical Materials and Methods section "Supports and Anchors".

3.5 Installation of Cleanouts: Install in above ground piping and building drain piping as indicated, as required by Florida Building Code-Plumbing; and at each change in direction of piping greater than 45°; at minimum intervals of 50' for piping 4" and smaller and 100' for larger piping; and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping, select type to match adjacent building finish.

3.5.1 Size: Cleanouts shall be full size up to 4". Piping over 4" shall have a reducing fitting to accommodate a 4" cleanout unless indicated otherwise on drawings.

3.5.2 Install cleanouts to allow adequate clearance for rodding.

3.5.3 Protect all finished surfaces of cleanouts with a suitable adhesive covering until construction is completed.

3.5.4 Cleanouts to Grade: Provide an 18" x 18" x 8" thick concrete pad around the cleanout. Set the cleanout ferrule, adapter, or access cover frame in the concrete as required. The cleanout shall be extended to the finished grade. The concrete pad shall slope away from the cleanout in all directions approximately one

inch. Cover pad with fill to finished grade.

- 3.5.5 Cleanouts in Paved Areas: Provide concrete pad similar to cleanout to grade and coordinate concrete depth at site with adjustable flange. Access cover frames are required.
- 3.6 Flashing Flanges: Install flashing flange and clamping device with each stack and cleanout passing through waterproof membranes.
- 3.7 Vent Flashing Sleeves: Install on stack passing through roof, secure to stack flashing in accordance with manufacturer's instructions. For metal roofs, sleeves and flashing are by Division-7.
- 3.8 Installation of Floor Drains: Install floor drains in accordance with manufacturer's written instructions and in locations indicated.
 - 3.8.1 Coordinate flashing work with work of waterproofing and adjoining substrate work.
 - 3.8.2 Install floor drains at low points of surface areas to be drained, or as indicated. Set tops of drains flush with finished floor.
 - 3.8.3 Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes, where penetrated.
 - 3.8.4 Position drains so that they are accessible and easy to maintain.
- 3.9 Connection of Trap Primers: Connect trap primers as indicated, and in accordance with manufacturer's installation instructions. Pitch piping towards drain trap, minimum of 1/8" per foot (1%). Adjust trap primer for proper flow.
- 3.10 Piping Runouts to Fixtures: Provide soil and waste piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated, but in no case smaller than required by Florida Building Code-Plumbing.
- 3.11 Test, clean, flush, and inspect soil and waste piping in accordance with requirements of Division-23 Basic Mechanical Materials and Methods section "Testing, Cleaning and Sterilization of Piping Systems".

END OF SECTION 221316

SECTION 223000 – PLUMBING FIXTURES, EQUIPMENT, TRIM & SCHEDULE

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-22 Basic Plumbing Requirements and Basic Plumbing Materials and Methods sections apply to work of this section.
- 1.3 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.
- 1.4 Extent of plumbing fixtures work required by this section is indicated on drawings and schedules, and by requirements of this section.
- 1.5 Refer to Division-26 sections for field-installed electrical wiring required for plumbing fixtures; not work of this section.
- 1.6 Codes and Standards:
 - 1.6.1 Plumbing Fixture Standards: Comply with applicable portions of Florida Building Code-Plumbing pertaining to materials and installation of plumbing fixtures.
 - 1.6.2 ANSI Standards: Comply with applicable ANSI standards pertaining to plumbing fixtures and systems.
 - 1.6.3 PDI Compliance: Comply with standards established by PDI pertaining to plumbing fixture supports.
 - 1.6.4 UL Listing: Construct plumbing fixtures requiring electrical power in accordance with UL standards and provide UL-listing and label.
 - 1.6.5 ARI Compliance: Construct and install water coolers in accordance with ARI Standard 1010 "Drinking-Fountains and Self-Contained Mechanically-Refrigerated Drinking-Water Coolers", and provide Certification Symbol.
 - 1.6.6 ANSI Compliance: Construct and install barrier-free plumbing fixtures in accordance with ANSI Standard A117.1 "Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People".
- 1.7 Approval Submittals:
 - 1.7.1 Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, furnished specialties and accessories; and installation instructions. Submit manufacturer's assembly-type drawings indicating dimensions, roughing-in requirements, required clearances, and methods of assembly of components and anchorages. The submittal shall be organized by "fixture number" and each fixture package shall be so identified. Each fixture package shall include all of the required fitting and trim, even if such devices are used for more than one fixture.
- 1.8 O&M Data Submittals: Submit a copy of approval submittals. Submit maintenance data and parts

lists for each type of plumbing fixture and accessory; including "trouble-shooting" maintenance guide. Include these data in O&M manual.

- 1.9 Handle plumbing fixtures carefully to prevent breakage, chipping and scoring fixture finish. Do not install damaged plumbing fixtures; replace and return damaged units to equipment manufacturer.

2 PRODUCTS

- 2.1 General: Provide factory-fabricated fixtures of type, style and material indicated. For each type fixture, provide trim, carrier, seats, and valves as specified. Where not specified, provide products as recommended by manufacturer, and as required for complete installation. Where more than one type is indicated, selection is Installer's option; but, all fixtures of same type must be furnished by single manufacturer. Where type is not otherwise indicated, provide fixtures complying with governing regulations.

- 2.2 Model Numbers: Basis of design model numbers of a particular manufacturer are listed in the fixture schedule as an aid to contractors. Where conflicts between the model number and the written description occur, the written description shall govern. Where acceptable manufacturers are listed, products are subject to compliance with requirements.

- 2.3 Refer to plumbing construction documents for fixture specifications.

2.4 Materials:

- 2.4.1 Provide materials which have been selected for their surface flatness and smoothness. Exposed surfaces which exhibit pitting seam marks, roller marks, foundry sand holes, stains, decoloration, or other surface imperfections on finished units are not acceptable.

- 2.4.2 All fixtures shall be white vitreous china unless otherwise specifically noted. Where enameled iron fixtures are specified, they shall be furnished with acid resisting enamel.

- 2.4.3 Where fittings, trim and accessories are exposed or semi-exposed provide bright chrome-plated or polished stainless steel units. Provide copper or brass where not exposed.

- 2.4.4 Stainless Steel Sheets: ASTM A 167, Type 302/304, hardest workable temper. Finish shall be No. 4, bright, directional polish on exposed surfaces.

- 2.4.5 Vitreous China: High quality, free from fire cracks, spots, blisters, pinholes and specks; glaze exposed surfaces, and test for crazing resistance in accordance with ASTM C 554.

- 2.4.6 Synthetic Stone: High quality, free from defects, glaze on exposed surfaces, stain resistant.

2.5 Plumbing Fittings, Trim and Accessories:

- 2.5.1 Faucets: At locations where water is supplied (by manual, automatic or remote control), provide commercial quality chrome-plated, cast-brass faucets, valves, or other dispensing devices, of type and size indicated, and as required to operate as indicated.

- 2.5.1.1 Aerators: Provide aerators of types approved by Health Department having jurisdiction.

- 2.5.1.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Chicago Faucet Co., Kohler Co., Speakman Co., T & S Brass and Bronze Works, Water Saver Faucet Co., Zurn.
- 2.5.2 Stops: Provide chrome-plated brass, angle type, manual shutoff valves and 3/8" chrome-plated flexible supply pipes to permit fixture servicing without shutdown of water supply piping systems for all fixtures. Coordinate with fixture requirements.
 - 2.5.2.1 Provide loose key stops.
 - 2.5.2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Zurn or approved equal.
- 2.5.3 Waste Outlets: Provide removable P-traps, drains, waste arms, tailpieces and wastes-to-wall where drains are indicated for direct connection to drainage system for all fixtures unless otherwise noted. Provide drains, tailpieces and waste arms where indirect drains are indicated. Waste outlets shall be full size of fixture drain connection.
 - 2.5.3.1 Provide chrome-plated cast-brass P-traps and drains with cleanout.
 - 2.5.3.2 P-traps, wastes and drains of all types shall be 17-gauge.
 - 2.5.3.3 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Zurn, or approved equal.
- 2.5.4 Carriers: Provide cast-iron supports for fixtures of either graphitic gray iron, ductile iron, or malleable iron or steel as indicated. Coordinate with specific fixture requirements and conditions of the project.
 - 2.5.4.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Josam, Wade, Zurn, J.R. Smith.
- 2.5.5 Fixture Bolt Caps: Provide manufacturer's standard exposed fixture bolt caps finished to match fixture finish.
- 2.5.6 Escutcheons: Where fixture supplies and drains penetrate walls in exposed locations, provide chrome-plated brass escutcheons with friction clips.
- 2.5.7 Comply with additional fixture requirements listed for each fixture and as required for a complete and functional system.
- 2.6 Water Closets:
 - 2.6.1 General: Provide white china siphon jet type unless otherwise noted.
 - 2.6.1.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane, Kohler, or Zurn.
 - 2.6.2 Fixture Seats: Provide white, heavy molded plastic fixture seats with stainless steel self-sustaining

check hinges.

- 2.6.2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Bemis Mfg. Co., Beneke Corp., Church or Comfort Seats.

2.7 Lavatories:

- 2.7.1 General: Provide white china lavatories.

- 2.7.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane, Kohler, or Zurn.

2.8 Electric Water Coolers:

- 2.8.1 General: Provide self-contained electric water cooler with entire water system free of lead. All joints shall be made using silver solder. Units shall be complete with an air-cooled refrigeration system consisting of a hermetic compressor, cooler, pre-cooler, condenser fan, thermostat safety controls and all other related devices. The unit shall have a capacity of 8 gallons per hour. The cabinet shall be stainless steel with vermin proof insulation. The top shall be fabricated of stainless steel with a No. 4 finish. Where handicap units are indicated, the bubbler and fountain shall be ADA compliant.

- 2.8.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Elkay Mfg. Co., Halsey Taylor Div., Haws Drinking Faucet Co., Sunroc, Oasis.

2.9 Mop Receptors:

- 2.9.1 General: Provide one piece mop receptors with 3" integral stainless steel grid drain. Provide wall-mounted faucet with arm handles, vacuum breaker, stops, hose connection and hose bracket. Provide 30" hose.

- 2.9.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Stern-Williams Co., or Acorn.

2.10 Service Sinks:

- 2.10.1 General: Provide acid resistant service sinks with back and wall hanger. Provide double faucet with bucket hook, vacuum breaker, stops and hose end. Provide 3" trap to wall, enameled inside, painted outside with foot support. Provide stainless steel rim guard. Paint outside of sink and trap black.

- 2.10.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane co., Eljer co., Fiat Products, Kohler Co., Stern-Williams Co.

2.11 Stainless Steel Sinks:

- 2.11.1 General: Provide Type 304, 18 gauge self-rimming stainless steel back ledge with No. 4 finish . Provide sound deadening material on the sides and bottom of the sink. Provide grid drain or strainer

with removable crumb cup and stopper as indicated.

- 2.11.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Elkay, Just

2.12 Water Heaters:

- 2.12.1 Accessories: VB, relief, pan, stand, etc.

- 2.12.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Ruud, Rheem, Mor-Flo, State, A.O. Smith.

3 EXECUTION

- 3.1 Examine roughing-in work of potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Also examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping, and other unsatisfactory conditions for installation of plumbing fixtures. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- 3.2 Install plumbing fixtures of types indicated where shown and at indicated heights. Install in accordance with fixture manufacturer's written instructions, roughing-in drawings, and with recognized industry practices. Install in accordance with ADA and applicable handicap code requirements. Ensure that plumbing fixtures comply with requirements and serve intended purposes. Comply with applicable requirements of Florida Building Code-Plumbing pertaining to installation of plumbing fixtures. Furnish templates for cut-outs in countertops. Coordinate exact fixture locations with countertop shop drawings.
- 3.3 Fasten plumbing fixtures securely to indicated supports or building structure; and ensure that fixtures are level and plumb. Secure plumbing supplies behind or within wall construction so as to be rigid, and not subject to pull or push movement. Mount at heights shown on the drawings. Fixture heights are floor-to-rim distance. Fitting heights are to centerline.
- 3.4 Install stop valve in water supply to each fixture.
- 3.5 After fixtures are set, the crack between the fixture and wall shall be caulked with DAP silicone-based caulking, or approved product specified by the architect.
- 3.6 Protect installed fixtures from damage during remainder of construction period.
- 3.7 Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
- 3.8 Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect/Engineer. Remove cracked or dented units and replace with new units.

- 3.9 Clean plumbing fixtures, trim, aerators, and strainers of dirt and debris upon completion of installation.
- 3.10 Adjust water pressure at drinking fountains, faucets to provide proper flow stream and specified gpm.
- 3.11 Adjust or replace washers to prevent leaks at faucets and stops.

END OF SECTION 223000

PART 04 MECHANICAL SPECIFICATIONS (WATFORD)

SECTION 230100 – MECHANICAL GENEREAL

1 GENERAL

- 1.1 The work covered by this division consists of providing all labor, equipment and materials and performing all operations necessary for the installation of the mechanical work as herein called for and shown on the drawings.
- 1.2 Related Documents:
 - 1.2.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
 - 1.2.2 This is a Basic Mechanical Requirements Section. Provisions of this section apply to work of all Division 23 sections.
 - 1.2.3 Review all other contract documents to be aware of conditions affecting work herein.
 - 1.2.4 Definitions:
 - 1.2.4.1 Provide: Furnish and install, complete and ready for intended use.
 - 1.2.4.2 Furnish: Supply and deliver to project site, ready for subsequent requirements.
 - 1.2.4.3 Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.
- 1.3 Permits and Fees: Contractor shall obtain all necessary permits, meters, and inspections required for his work and pay all fees and charges incidental thereto.
- 1.4 Verification of Owner's Data: Prior to commencing any work the Contractor shall satisfy himself as to the accuracy of all data as indicated in these plans and specifications and/or as provided by the Owner. Should the Contractor discover any inaccuracies, errors, or omissions in the data, he shall immediately notify the Architect/Engineer in order that proper adjustments can be anticipated and ordered. Commencement by the Contractor of any work shall be held as an acceptance of the data by him after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions or inaccuracies of the said data.
- 1.5 Delivery and Storage of Materials: Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. All material shall be stored to provide protection from the weather and accidental damage.
- 1.6 Extent of work is indicated by the drawings, schedules, and the requirements of the specifications. Singular references shall not be constructed as requiring only one device if multiple devices are shown on the drawings or are required for proper system operation.
- 1.7 Field Measurements and Coordination:

- 1.7.1 The intent of the drawings and specifications is to obtain a complete and satisfactory installation. Separate divisional drawings and specifications shall not relieve the Contractor or subcontractors from full compliance of work of his trade indicated on any of the drawings or in any section of the specifications.
- 1.7.2 Verify all field dimensions and locations of equipment to insure close, neat fit with other trades' work. Make use of all contract documents and approved shop drawings to verify exact dimension and locations.
- 1.7.3 Coordinate work in this division with all other trades in proper sequence to insure that the total work is completed within contract time schedule and with a minimum cutting and patching.
- 1.7.4 Locate all apparatus symmetrical with architectural elements. Install to exact height and locations when shown on architectural drawings. When locations are shown only on mechanical drawings, be guided by architectural details and conditions existing at job and correlate this work with that of others.
- 1.7.5 Install work as required to fit structure, avoid obstructions, and retain clearance, headroom, openings and passageways. Cut no structural members without written approval.
- 1.7.6 Carefully examine any existing conditions, piping, and premises. Compare drawings with existing conditions. Report any observed discrepancies. It shall be the Contractor's responsibility to properly coordinate the work and to identify problems in a timely manner. Written instructions will be issued to resolve discrepancies.
- 1.7.7 Because of the small scale of the drawings, it is not possible to indicate all offsets and fittings or to locate every accessory. Drawings are essentially diagrammatic. Study carefully the sizes and locations of structural members, wall and partition locations, trusses, and room dimensions and take actual measurements on the job. Locate piping, ductwork, equipment and accessories with sufficient space for installing and servicing. Contractor is responsible for accuracy of his measurements and for coordination with all trades. Contractor shall not order materials or perform work without such verification. No extra compensation will be allowed because field measurements vary from the dimensions on the drawings. If field measurements show that equipment or piping cannot be fitted, the Architect/Engineer shall be consulted. Remove and relocate, without additional compensation, any item that is installed and is later found to encroach on space assigned to another use.
- 1.8 Guarantee:
- 1.8.1 The Contractor shall guarantee labor, materials and equipment for a period of one (1) year from Final Completion, or from Owner's occupancy, whichever is earlier. Contractor shall make good any defects and shall include all necessary adjustments to and replacement of defective items without expense to the Owner.
- 1.8.2 Owner reserves right to make emergency repairs as required to keep equipment in operation without voiding Contractor's Guarantee Bond nor relieving Contractor of his responsibilities during guarantee period.
- 1.9 Approval Submittals:

- 1.9.1 When approved, the submittal control log and submittals shall be an addition to the specifications herewith, and shall be of equal force in that no deviation will be permitted except with the approval of the Architect/Engineer.
 - 1.9.1.1 Shop drawings, product literature, and other approval submittals will only be reviewed if they are submitted in full accordance with the General and Supplementary Conditions and Division 1 Specification sections and the following.
 - 1.9.1.1.1 Submittals shall be properly organized in accordance with the approved submittal control log.
 - 1.9.1.1.2 Submittals shall not include items from more than one specification section in the same submittal package unless approved in the submittal control log.
 - 1.9.1.1.3 Submittals shall be properly identified by a cover sheet showing the project name, Architect and Engineer names, submittal control number, specification section, a list of products or item names with model numbers in the order they appear in the package, and spaces for approval stamps. A sample cover sheet is included at the end of this section.
 - 1.9.1.1.4 Submittals shall have been reviewed and approved by the General Contractor (or Prime Contractor). Evidence of this review and approval shall be an "Approved" stamp with a signature and date on the cover sheet.
 - 1.9.1.1.5 Submittals that include a series of fixtures or devices (such as plumbing fixtures or valves) shall be organized by the fixture number or valve type and be marked accordingly. Each fixture must include all items associated with that fixture regardless of whether or not those items are used on other fixtures.
 - 1.9.1.1.6 The electrical design shown on the drawings supports the mechanical equipment basis of design specifications at the time of design. If mechanical equipment is submitted with different electrical requirements, it is the responsibility of the mechanical contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the mechanical submittal with a written statement that this change will be provided at no additional cost. Mechanical submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost.
- 1.9.2 If the shop drawings show variation from the requirements of contract because of standard shop practice or other reasons, the Contractor shall make specific mention of such variation in writing in his letter of transmittal and on the submittal cover sheet in order that, if acceptable, Contractor will not be relieved of the responsibility for executing the work in accordance with the contract.
- 1.9.3 Review of shop drawings, product literature, catalog data, or schedules shall not relieve the Contractor from responsibility for deviations from contract drawings or specifications, unless he has in writing called to the attention of the Architect/Engineer each such deviation in writing at the time of submission, nor shall it relieve him from responsibility for errors of any sort in shop drawings, product literature, catalog data, or schedules. Any feature or function specified but not mentioned in the submittal shall be assumed to be included per the specification.
- 1.9.4 Submit shop drawings as called for in other sections after award of the contract and before any material is ordered or fabricated. Shop drawings shall consist of plans, sections, elevations and details

to scale (not smaller than ¼" per foot), with dimensions clearly showing the installation. Direct copies of small scale project drawings issued to the Contractor are not acceptable. Drawings shall take into account equipment furnished under other sections and shall show space allotted for it. Include construction details and materials.

- 1.10 Test Reports and Verification Submittals: Submit test reports, certifications and verification letters as called for in other sections. Contractor shall coordinate the required testing and documentation of system performance such that sufficient time exists to prepare the reports, submit the reports, review the reports and take corrective action within the scheduled contract time.
- 1.11 O&M Data Submittals: Submit Operation and Maintenance data as called for in other sections. When a copy of approval submittals is included in the O&M Manual, only the final "Approved" or "Approved as Noted" copy shall be used. Contractor shall organize these data in the O&M Manuals tabbed by specification number. Prepare O&M Manuals as required by Division 1 and as described herein. Submit manuals at the Substantial Completion inspection.

2 PRODUCTS

- 2.1 All materials shall be new or Owner-supplied reused as shown on the drawings, the best of their respective kinds, suitable for the conditions and duties imposed on them at the building and shall be of reputable manufacturers. The description, characteristics, and requirements of materials to be used shall be in accordance with qualifying conditions established in the following sections.
- 2.2 Equipment and Materials:
- 2.2.1 Shall be new and the most suitable grade for the purpose intended. Equipment furnished under this division shall be the product of a manufacturer regularly engaged in the manufacture of such items for a period of three years. Where practical, all of the components shall be products of a single manufacturer in order to provide proper coordination and responsibility. Where required, Contractor shall furnish proof of installation of similar units or equipment.
- 2.2.2 Each item of equipment shall bear a name plate showing the manufacturer's name, trade name, model number, serial number, ratings and other information necessary to fully identify it. This plate shall be permanently mounted in a prominent location and shall not be concealed, insulated or painted.
- 2.2.3 The label of the approving agency, such as UL, IBR, ASME, ARI, AMCA, by which a standard has been established for the particular item shall be in full view.
- 2.2.4 The equipment shall be essentially the standard product of a manufacturer regularly engaged in the production of such equipment and shall be a product of the manufacturer's latest design.
- 2.2.5 A service organization with personnel and spare parts shall be available within two hours for each type of equipment furnished.
- 2.2.6 Install in accordance with manufacturer's recommendations. Place in service by a factory trained representative where required.
- 2.2.7 Materials and equipment are specified herein by a single or by multiple manufacturers to indicate quality, material and type of construction desired. Manufacturer's products shown on the drawings have been used as basis for design; it shall be the Contractor's responsibility to ascertain that alternate

manufacturer's products, or the particular products of named manufacturers, meet the detailed specifications and that size and arrangement of equipment are suitable for installation.

2.2.8 Model Numbers: Catalog numbers and model numbers indicated in the drawings and specifications are used as a guide in the selection of the equipment and are only listed for the contractor's convenience. The contractor shall determine the actual model numbers for ordering materials in accordance with the written description of each item and with the intent of the drawings and specifications.

2.3 Requests for Substitution:

2.3.1 Where a particular system, product or material is specified by name, consider it as standard basis for bidding, and base proposal on the particular system, product or material specified.

2.3.2 Requests by Contractor for substitution will be considered only when reasonable, timely, fully documented, and qualifying under one or more of the following circumstances.

2.3.2.1 Required product cannot be supplied in time for compliance with Contract time requirements.

2.3.2.2 Required product is not acceptable to governing authority, or determined to be non-compatible, or cannot be properly coordinated, warranted or insured, or has other recognized disability as certified by Contractor.

2.3.2.3 Substantial cost advantage is offered Owner after deducting offsetting disadvantages including delays, additional compensation for redesign, investigation, evaluation and other necessary services and similar considerations.

2.3.3 All requests for substitution shall contain a "Comparison Schedule" and clearly and specifically indicate any and all differences or omissions between the product specified as the basis of design and the product proposed for substitution. Differences shall include but shall not be limited to data as follows for both the specified and substituted products:

Principal of operation.

Materials of construction or finishes.

Thickness of gauge of materials.

Weight of item.

Deleted features or items.

Added features or items.

Changes in other work caused by the substitution.

Performance curves.

If the approved substitution contains differences or omissions not specifically called to the attention of the Architect/Engineer, the Owner reserves the right to require equal or similar features to be added to the substituted products (or to have the substituted products replaced) at the Contractor's expense.

3 EXECUTION

3.1 Workmanship: All materials and equipment shall be installed and completed in a first-class workmanlike manner and in accordance with the best modern methods and practice. Any materials installed which do not present an orderly and reasonably neat and/or workmanlike appearance, or do

not allow adequate space for maintenance, shall be removed and replaced when so directed by the Architect/Engineer.

3.2 Coordination:

3.2.1 The Contractor shall be responsible for full coordination of the mechanical systems with shop drawings of the building construction so the proper openings and sleeves or supports are provided for piping, ductwork, or other equipment passing through slabs or walls.

3.2.2 Any additional steel supports required for the installation of any mechanical equipment, piping, or ductwork shall be furnished and installed under the section of the specifications requiring the additional supports.

3.2.3 It shall be the Contractor's responsibility to see that all equipment such as valves, dampers, filters and such other apparatus or equipment that may require maintenance and operation are made easily accessible, regardless of the diagrammatic location shown on the drawings.

3.2.4 All connections to fixtures and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.

3.2.5 The contractor shall protect equipment, material, and fixtures at all times. He shall replace all equipment, material, and fixtures which are damaged as a result of inadequate protection.

3.2.6 Prior to starting and during progress of work, examine work and materials installed by others as they apply to work in this division. Report conditions which will prevent satisfactory installation.

3.2.7 Start of work will be construed as acceptance of suitability of work of others.

3.3 Interruption of Service: Before any equipment is shut down for disconnecting or tie-ins, arrangements shall be made with the Architect/Engineer and this work shall be done at the time best suited to the Owner. This will typically be on weekends and/or holidays and/or after normal working hours. Services shall be restored the same day unless prior arrangements are made. All overtime or premium costs associated with this work shall be included in the base bid.

3.4 Phasing: Provide all required temporary valves, piping, ductwork, equipment and devices as required. Maintain temporary services to areas as required. Remove all temporary material and equipment on completion of work unless Engineer concurs that such material and equipment would be beneficial to the Owner on a permanent basis.

3.5 Cutting and Patching: Notify General Contractor to do all cutting and patching of all holes, chases, sleeves, and other openings required for installation of equipment furnished and installed under this section. Utilize experienced trades for cutting and patching. Obtain permission from Architect/Engineer before cutting any structural items.

3.6 Equipment Setting: Bolt equipment directly to concrete pads or vibration isolators as required, using hot-dipped galvanized anchor bolts, nuts and washers. Level equipment.

3.7 Painting: Touch-up factory finishes on equipment located inside and outside shall be done under Division 23. Obtain matched color coatings from the manufacturer and apply as directed. If

corrosion is found during inspection on the surface of any equipment, clean, prime, and paint, as required.

- 3.8 Clean-up: Thoroughly clean all exposed parts of apparatus and equipment of cement, plaster, and other materials and remove all oil and grease spots. Repaint or touch up as required to look like new. During progress of work, contractor is to carefully clean up and leave premises and all portions of building free from debris and in a clean and safe condition.
- 3.9 Start-up and Operational Test: Start each item of equipment in strict accordance with the manufacturer's instructions; or where noted under equipment specification, start-up shall be done by a qualified representative of the manufacturer. Alignment, lubrication, safety, and operating control shall be included in start-up check.
- 3.10 Climate Control: Operate heating and cooling systems as required after initial startup to maintain temperature and humidity conditions to avoid freeze damage and warping or sagging of ceilings and carpet.
- 3.11 Record Drawings:
- 3.11.1 During the progress of the work the Contractor shall record on their field set of drawings the exact location, as installed, of all piping, ductwork, equipment, and other systems which are not installed exactly as shown on the contract drawings.
- 3.11.2 Upon completion of the work, record drawings shall be prepared as described in the General Conditions, Supplementary Conditions, and Division 1 sections.
- 3.12 Acceptance:
- 3.12.1 Punch List: Submit written confirmation that all punch lists have been checked and the required work completed.
- 3.12.2 Instructions: At completion of the work, provide a competent and experienced person who is thoroughly familiar with project, for one day to instruct permanent operating personnel in operation of equipment and control systems. This is in addition to any specific equipment operation and maintenance training.
- 3.12.3 Operation and Maintenance Manuals: Furnish four complete manuals bound in ring binders with Table of Contents, organized, and tabbed by specification section. Manuals shall contain:
- Detailed operating instructions and instructions for making minor adjustments.
 - Complete wiring and control diagrams.
 - Routine maintenance operations.
 - Manufacturer's catalog data, service instructions, and parts lists for each piece of operating equipment.
 - Copies of approved submittals.
 - Copies of all manufacturer's warranties.
 - Copies of test reports and verification submittals.
- 3.12.4 Record Drawings: Submit record drawings.

- 3.12.5 Test and Balance Report: Submit four certified copies. The Report shall be submitted for review prior to the Substantial Completion Inspection unless otherwise required by Division 1.
- 3.12.6 Acceptance will be made on the basis of tests and inspections of job. A representative of firm that performed test and balance work shall be in attendance to assist. Contractor shall furnish necessary mechanics to operate system, make any necessary adjustments and assist with final inspection.
- 3.12.7 Closeout Documents: The following closeout documents must be completed and submitted to engineer prior to occupancy of the building. Provide written confirmation to engineer that these have been completed and submitted:

STATEMENT DESCRIBING HVAC SCOPE OF WORK
 HVAC CONTRACTOR'S WARRANTY LETTER
 HVAC EQUIPMENT WARRANTY DOCUMENTS
 HVAC EQUIPMENT OPERATIONS & MAINTENANCE MANUAL
 HVAC EQUIPMENT STARTUP REPORTS
 HVAC AS-BUILT OF CONTROLS DRAWINGS
 HVAC AS-BUILT DRAWINGS
 HVAC TRAINING DOCUMENTS & SIGN-IN SHEET
 HVAC CONTROL SUBCONTRACTOR CERTIFICATION OF COMPLETION
 TEST AND BALANCE REPORT
 RECORD OF APPROVED HVAC SUBMITTALS

END OF SECTION 230100

SECTION 230513 – ELECTRIC MOTORS

1 GENERAL

- 1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Section apply to work of this Section.
- 1.2 This section is a Division 23 Basic Mechanical Materials and Methods section, and is part of each Division 23 section making reference to motors specified herein.
- 1.3 Extent of motors required by this section is indicated on drawings and/or specified in other Division-23 sections.
- 1.4 Comply with the requirements of Division 26.
- 1.5 UL Compliance: Comply with applicable UL standards pertaining to motors.
- 1.6 Approval Submittals:
 - 1.6.1 Product Data: When required by other Division-23 sections, submit manufacturers standard product data sheets for each type of motor provided. Submit with Division-23 section using the motors, not as a separate submittal. Mark data sheet with arrows indicating product being supplied and list by unique descriptive name all motors to which each data sheet applies. Clearly indicate type, service factor, rpm, duty cycle, voltage, phase, nominal full load efficiency, power factor and insulation class. Field verify and coordinate mounting and frame requirements for matching the drive.
 - 1.7 O&M Data Submittals: Submit a copy of approval submittals. Submit operation and maintenance data for each type of motor. Include these data in O&M Manual. Submit two copies of nameplate data sheet for each motor. One copy shall be included with the O&M Manual and a second copy shall be inserted in a waterproof pouch or bag and attached to the motor. Nameplate data sheets shall be typed or neatly printed and shall include all data on the motor nameplate plus a unique motor description such as "AHU-3 Fan Motor", "Distribution Pump #1" or similar description.

2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, General Electric, Baldor, US Electric, or approved equal.
- 2.2 General:
 - 2.2.1 Motors shall conform to applicable portions of NEMA Standard MG-1, Motors and Generators.
 - 2.2.2 Motors shall be sized for the application such that when the driven equipment is operated at rated capacity the motor current will not exceed the full-load nameplate current. Service factor shall not be used in normal operation.
- 2.3 Motor Design:
 - 2.3.1 Integral Horsepower Motors:

- 2.3.1.1 Motors shall be open drip-proof or totally enclosed fan cooled as shown on the drawings or listed in the Division 23 section requiring motors.
- 2.3.1.2 Motors shall be three phase, 60 hertz, nominal 1800 rpm, rated at 200 volts for 208 volt systems, 230 volts for 240 volt systems and 460 volts for 480 volt systems.
- 2.3.1.3 Motors shall be NEMA Design B and shall have 1.15 service factor or greater at 60 hertz.
- 2.3.1.4 Insulation Systems
- 2.3.1.4.1 In fixed speed applications, motors shall have Class B insulation with 80°C rise over 40°C ambient.
- 2.3.1.4.2 For variable frequency drive (VFD) applications, motors shall have Class F insulation with 105°C rise over 40°C ambient. Motor manufacturer shall identify motors being used for VFD applications by marking the motor with a stainless steel name-plate "Inverter Ready".
- 2.3.1.5 Motor efficiencies shall be based on IEEE-112, 1984, Test Method B, as specified in NEMA Standard MG1-12.53. NEMA motor efficiency and power factor shall be clearly shown on the motor nameplate. Inverter duty motors shall have a CIV rating based on NEMA.
- 2.3.1.6 Motors shall be premium efficiency type and shall meet or exceed the following minimum nominal efficiencies at rated voltage.

230/460 VOLT, 3 PHASE

HORSEPOWER RANGE	MINIMUM NOMINAL EFFICIENCY	MINIMUM ACCEPTABLE POWER FACTOR
1 to 2 hp	84.0 pct.	75.0 pct
3 to 5 hp	87.5 pct.	77.0 pct
7.5 hp	89.5 pct.	80.0 pct
10 hp	90.2 pct.	80.0 pct
15 hp	91.0 pct.	82.0 pct
20 to 25 hp	92.0 pct.	82.0 pct
30 hp	92.4 pct.	82.0 pct
40 to 50 hp	93.0 pct.	85.0 pct
60 hp	93.6 pct.	85.0 pct
75 hp	94.1 pct.	85.0 pct
100 to 125 hp	94.5 pct.	85.0 pct
150 to 200 hp	95.0 pct.	85.0 pct
over 200 hp	95.4 pct.	87.0 pct

200 VOLT, 3 PHASE

HORSEPOWER RANGE	MINIMUM NOMINAL EFFICIENCY	MINIMUM ACCEPTABLE POWER FACTOR

1 to 2 hp	84.0 pct.	75.0 pct
3 to 5 hp	87.5 pct.	77.0 pct
7.5 hp	89.5 pct.	80.0 pct
10 hp	90.2 pct.	80.0 pct
15 hp	91.0 pct.	80.0 pct
20 to 25 hp	92.0 pct.	80.0 pct

- 2.3.1.7 Motors 25 hp and larger which are to be installed outdoors or in other high humidity areas shall be equipped with silicone rubber space heaters. Space heaters shall be energized when motor is de-energized.
- 2.3.2 Fractional Horsepower Motors one-half hp and above:
- 2.3.2.1 Motors shall be open drip-proof or totally enclosed fan cooled as shown on the drawings or listed in the Division 23 section requiring motors.
- 2.3.2.2 Motors shall be three phase, 60 hertz, nominal 1800 rpm, rated at 200, 230 or 460 volts as shown on the drawings.
- 2.3.2.3 Motors shall be NEMA Design B with class B insulation, unless used with variable frequency drives.
- 2.3.3 Fractional Horsepower Motors less than one-half hp:
- 2.3.3.1 Motors shall be single phase, 60 hertz, rated at 120 volts with integral thermal protection.
- 2.4 Overload Protection: Properly sized overload protection shall be provided for each motor. This protection may be an integral part of the motor or may be part of the motor controller and shall interrupt each ungrounded conductor.
- 3 EXECUTION
- 3.1 Motor Size and Location:
- 3.1.1 Size and location of motors shown on the drawings are based on a particular design and may change with a different manufacturer. Submittal of shop drawings or product literature indicating motor sizes or locations different from that designed indicates that Contractor has fully coordinated any required changes to the electrical system with other trades. Approval (if made) is on this basis and no additional cost will be allowed for any changes.
- 3.1.2 Contractor shall verify and make any necessary adjustments to electrical service, branch circuit wiring, branch circuit protection, overload protection, disconnect and controller (starter), or VFD based on actual nameplate data of the motors supplied prior to installation. Where applicable, connect motor winding thermostat to VFD.
- 3.2 Motor Voltages: Contractor shall field verify system voltage prior to ordering or installing any motors. Submittal of shop drawings or product literature indicating motor voltages indicates that Contractor has fully coordinated the motor with the electrical system and that any discrepancies have been resolved. Approval (if made) is on this basis and no additional cost will be allowed for any changes.

- 3.3 Motor Mounting: Adjust motor mounting as required to adjust the drive train for proper belt operation and to accommodate sheave changes or other requirements of the test and balance work.

END OF SECTION 230513

SECTION 230520 – PIPES AND PIPE FITTINGS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-23 Basic Mechanical Materials and Methods section, and is part of each Division-22 and 23 section making reference to pipes and pipe fittings specified herein.
- 1.3 Extent of pipes and pipe fittings required by this section is indicated on drawings and/or specified in other Division-22 and 23 sections.
- 1.4 Codes and Standards:
- 1.4.1 Welding: Qualify welding procedures, welders and operators in accordance with ASME B31.1, or ASME B31.9, as applicable, for shop and project site welding of piping work.
- 1.4.2 Brazing: Certify brazing procedures, brazers, and operators in accordance with ASME Boiler and Pressure Vessel Code, Section IX, for shop and job-site brazing of piping work.
- 1.5 Test Report and Verification Submittals:

Submit welding certification for all welding installers.
Submit brazing certification for all brazing installers.

2 PRODUCTS

- 2.1 Piping Materials: Provide pipe and tube of type, joint type, grade, size and weight (wall thickness or Class) indicated for each service. Where type, grade or class is not indicated, provide proper selection as determined by Installer for installation requirements, and comply with governing regulations and industry standards.
- 2.2 Pipe/Tube Fittings: Provide factory-fabricated fittings of type, materials, grade, class and pressure rating indicated for each service and pipe size. Provide sizes and types matching pipe, tube, valve or equipment connection in each case. Where not otherwise indicated, comply with governing regulations and industry standards for selections, and with pipe manufacturer's recommendations where applicable.
- 2.3 Piping Materials/Products:
- 2.3.1 Soldering Materials:
- 2.3.1.1 Tin-Antimony (95-5) Solder: ASTM B-32, Grade 95TA.
- 2.3.1.2 Silver-Phosphorus Solder: ASTM B-32, Grade 96TS.
- 2.3.2 Pipe Thread Tape: Teflon tape.
- 2.3.3 Protective Coating: Koppers Bitumastic No. 505 or equal.

- 2.3.4 Gaskets for Flanged Joints: ANSI B16.21; full-faced for cast iron flanges; raised-face for steel flanges, unless otherwise noted.
- 2.3.5 Welding Materials: Comply with Section II, Part C, ASME Boiler and Pressure Vessel Code for welding materials. Materials shall be determined by installer to comply with installation requirements.
- 2.3.6 Brazing Materials: Silver content of not less than 15%. Materials shall be determined by installer to comply with installation requirements.
- 2.4 Copper Tube and Fittings:
- 2.4.1 Copper Tube:
- 2.4.1.1 Copper Tube: ASTM B88; Type K or L as indicated for each service; hard-drawn temper unless specifically noted as annealed.
- 2.4.1.2 ACR Copper Tube: ASTM B280.
- 2.4.2 Fittings:
- 2.4.2.1 Wrought-Copper Solder-Joint Fittings: ANSI B16.22.
- 2.4.2.2 Copper Tube Unions: Provide standard products recommended by manufacturer for use in service indicated.
- 2.4.2.3 Cast-Copper Flared Tube Fittings: ANSI B16.26.
- 2.5 Plastic Pipes and Fittings:
- 2.5.1 Pipes:
- 2.5.1.1 PVC DWV Pipe: ASTM D-2665, Schedule 40.
- 2.5.2 Fittings:
- 2.5.2.1 PVC Solvent Cement: ASTM D-2564.
- 2.5.2.2 PVC DWV Socket: ASTM D-2665.
- 3 EXECUTION
- 3.1 Installation
- 3.1.1 General: Install pipes and pipe fittings in accordance with recognized industry practices which will achieve permanently-leak proof piping systems, capable of performing each indicated service without piping failure. Install each run with minimum joints and couplings, but with adequate and accessible unions for disassembly and maintenance or replacement of valves and equipment. Reduce sizes

(where indicated) by use of reducing fittings, not bushings. Align piping accurately at connections, within 1/16" misalignment tolerance.

- 3.1.2 Comply with ANSI B31 Code for Pressure Piping.
- 3.1.3 Locate piping runs, except as otherwise indicated, vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown or described by diagrams, details and notations or, if not otherwise indicated, run piping in shortest route which does not obstruct usable space or block access for servicing building and its equipment. Hold piping close to walls, overhead construction, columns and other structural and permanent-enclosure elements of building; limit clearance to ½" where furring is shown for enclosure or concealment of piping, but allow for insulation thickness, if any. Where possible, locate insulated piping for 1" clearance outside insulation.
- 3.1.4 Concealed Piping: Unless specifically noted as "Exposed" on the drawings, conceal piping from view in finished and occupied spaces, by locating in column enclosures, chases, in hollow wall construction or above suspended ceilings; do not encase horizontal runs in solid partitions, except as indicated.
- 3.1.5 Electrical Equipment Spaces: Do not run piping through transformer vaults and other electrical, communications, or data equipment spaces and enclosures unless shown. Install drip pan under piping that must run through electrical spaces.
- 3.1.5.1 Cut pipe from measurements taken at the site, not from drawings. Keep pipes free of contact with building construction and installed work.
- 3.2 Piping System Joints: Provide joints of the type indicated in each piping system.
- 3.2.1 Solder copper tube-and-fitting joints where indicated, in accordance with recognized industry practice. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings. Apply non-acid type solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens.
- 3.2.2 Thread pipe in accordance with ANSI B2.1; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed. Paint exposed threads to retard rusting.
- 3.2.3 Flanged Joints: Match flanges within piping system, and at connection with valves and equipment. Clean flange faces and install gaskets. Tighten bolts to provide uniform compression of gaskets. Bolts shall project 1/8" to 3/8" beyond nut face when tight.
- 3.2.4 Weld pipe joints in accordance with recognized industry practice and as follows. Be guided by ANSI B.31.
- 3.2.4.1 Weld pipe joints only when ambient temperature is above 0°F.
- 3.2.4.2 Bevel pipe ends at a 37.5° angle where possible, smooth rough cuts, and clean to remove slag, metal particles and dirt.

- 3.2.4.3 Use pipe clamps or tack-weld joints; 4 welds for pipe sizes to 10". All welds shall be open-butt.
- 3.2.4.4 Build up welds with root pass, followed by filler pass and then a cover pass. Eliminate valleys at center and edges of each weld. Weld by procedures which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow-holes and non-metallic inclusions.
- 3.2.4.5 Do not weld-out piping system imperfections by tack-welding procedures; refabricate to comply with requirements.
- 3.2.4.6 At Installer's option, install forged branch-connection fittings wherever branch pipe is less than 3" and at least two pipe sizes smaller than main pipe indicated; or install regular "T" fitting. Weld-O-Let or equal.
- 3.2.5 Plastic Pipe Joints: Comply with manufacturer's instructions and recommendations, and with applicable industry standards.
 - 3.2.5.1 Solvent-cemented joints shall be made in accordance with ASTM D-2235 and ASTM F-402.
 - 3.2.5.2 PVC sewer pipe bell/gasket joints shall be installed in accordance with ASTM D-2321.
- 3.2.6 Braze copper tube-and-fitting joints where indicated, in accordance with ANSI B.31.
- 3.3 Piping Installation
 - 3.3.1 Install piping to allow for expansion and contraction.
 - 3.3.2 Isolate all copper tubing from steel and concrete by wrapping the pipe at the contact point, and for one inch on each side, with a continuous plastic sleeve. Isolate all copper tubing installed in block walls with a continuous plastic sleeve.
 - 3.3.3 Underground Piping:
 - 3.3.3.1 Provide plastic tape markers over all underground piping. Provide copper wire over all underground plastic piping outside the building. Locate markers 18" above piping.
 - 3.3.3.2 Coat the following underground (uninsulated) pipes with a heavy coat of bitumastic or provide an 8 mil polyvinyl sleeve: black steel pipe, galvanized steel pipe, copper tubing.

END OF SECTION 230520

SECTION 230521 – PIPING SPECIALTIES

1 GENERAL

- 1.1 Drawings and general provisions of contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-23 Basic Mechanical Materials and Methods section, and is part of each Division-22 and 23 section making reference to or requiring piping specialties specified herein.

2 PRODUCTS

- 2.1 General: Provide factory-fabricated piping specialties recommended by manufacturer for use in service indicated. Provide piping specialties of types and pressure ratings indicated for each service, or if not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes as indicated, and connections, which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is Installer's option.
- 2.2 Escutcheons:
 - 2.2.1 General: Provide pipe escutcheons as specified herein with inside diameter closely fitting pipe outside diameter, or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, or ceilings; and pipe sleeve extension, if any. Furnish pipe escutcheons with nickel or chrome finish for occupied areas, prime paint finish for unoccupied areas.
 - 2.2.2 Pipe Escutcheons for Moist Areas: For waterproof floors, and areas where water and condensation can be expected to accumulate, provide cast brass or sheet brass escutcheons, solid or split hinged.
 - 2.2.3 Pipe Escutcheons for Dry Areas: Provide sheet steel escutcheons, solid or split hinged.
- 2.3 Dielectric Unions: Provide standard products recommended by manufacturer Victaulic Style 47 dielectric waterways for use in service indicated, which effectively isolate ferrous from non-ferrous piping (electrical conductance), prevent galvanic action and stop corrosion. .
- 2.4 Fire Barrier Penetration Seals:
 - 2.4.1 Provide seals for any opening through fire-rated walls, floors, or ceilings used as passage for mechanical components such as piping or ductwork in accordance with the requirements of Division 7.
- 2.5 Fabricated Piping Specialties:
 - 2.5.1 Drip Pans: Provide drip pans fabricated from corrosion-resistant sheet metal with watertight joints, and with edges turned up 2-1/2". Reinforce top, either by structural angles or by rolling top over 1/4" steel rod. Provide hole, gasket, and flange at low point for watertight joint and 1" drain line connection.
 - 2.5.2 Pipe Sleeves: Provide pipe sleeves of one of the following:

- 2.5.2.1 Sheet-Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate from the following gages: 3" and smaller, 20 gage; 4" to 6" 16 gage; over 6", 14 gage.
- 2.5.2.2 Steel-Pipe: Fabricate from Schedule 40 galvanized steel pipe; remove burrs.
- 2.5.2.3 Iron-Pipe: Fabricate from cast-iron or ductile-iron pipe; remove burrs.
- 2.5.3 Sleeve Seals: Provide sleeve seals for sleeves located in foundation walls below grade, or in exterior walls, of one of the following:
 - 2.5.3.1 Caulking and Sealant: Provide foam or caulking and sealant compatible with piping materials used.
- 2.6 Low Pressure Y-Type Pipeline Strainers:
 - 2.6.1 General: Provide strainers full line size of connecting piping, with ends matching piping system materials. Provide Type 304 stainless steel screens.
 - 2.6.1.1 Water Strainers: Select for 200 psi working pressure (water, oil or gas). Provide 20 mesh screens through 2" size and 1/16" perforations for 2½" size and larger.
 - 2.6.2 Select from the following types:
 - 2.6.2.1 Threaded Ends, 2" and Smaller: Cast-iron body, screwed screen retainer with centered blowdown fitted with pipe plug.
 - 2.6.2.2 Threaded Ends, 2-1/2" and Larger: Cast-iron body, bolted screen retainer with off-center blowdown fitted with pipe plug.
 - 2.6.2.3 Flanged Ends, 2-1/2" and Larger: Cast-iron body, bolted screen retainer with off-center blowdown fitted with pipe plug.
- 3 EXECUTION
 - 3.1 Pipe Escutcheons: Install pipe escutcheons on each pipe penetration through floors, walls, partitions, and ceilings where penetration is exposed to view; and on exterior of building. Secure escutcheon to pipe or insulation so escutcheon covers penetration hole, and is flush with adjoining surface.
 - 3.2 Dielectric Unions: Install at each piping joint between ferrous and non-ferrous piping. Comply with manufacturer's installation instructions.
 - 3.3 Fire Barrier Penetration Seals: Provide pipe sleeve as required. Fill entire opening with sealing compound. Adhere to manufacturer's installation instructions. Refer to Division 7.
 - 3.4 Drip Pans: Locate drip pans under piping passing over or within 3' horizontally of electrical equipment, and elsewhere as indicated. Hang from structure with rods and building attachments, weld rods to sides of drip pan. Brace to prevent sagging or swaying. Connect 1" drain line to drain connection, and run to nearest plumbing drain or elsewhere as indicated.

- 3.5 Pipe Sleeves: Install pipe sleeves of types indicated where piping passes through walls, floors, ceilings, and roofs. Do not install sleeves through structural members of work, except as detailed on drawings, or as reviewed by Architect/Engineer. Install sleeves accurately centered on pipe runs. Size sleeves so that piping and insulation (if any) will have free movement in sleeve, including allowance for thermal expansion; but not less than 2 pipe sizes larger than piping run. Where insulation includes vapor-barrier jacket, provide sleeve with sufficient clearance for installation. Install length of sleeve equal to thickness of construction penetrated, and finish flush to surface; except floor sleeves. Extend floor sleeves $\frac{1}{4}$ " above level floor finish, and $\frac{3}{4}$ " above floor finish sloped to drain. Provide temporary support of sleeves during placement of concrete and other work around sleeves, and provide temporary closure to prevent concrete and other materials from entering sleeves.
- 3.5.1 Install sleeves in fire-rated assemblies in accordance with the listing of the assembly and the fire barrier sealant.
- 3.5.2 Install sheet-metal sleeves at interior partitions and ceilings other than suspended ceilings. Fill annular space with caulking or fire barrier sealant as required.
- 3.5.3 Install steel-pipe sleeves at floor penetrations. Fill annular space with caulking or fire barrier sealant as required.
- 3.5.4 Install iron-pipe sleeves at all foundation wall penetrations and at exterior penetrations; both above and below grade. Fill annular space with caulking or mechanical sleeve seals.
- 3.6 Y-Type Strainers: Install Y-type strainers full size of pipeline, in accordance with manufacturer's installation instructions. Install pipe nipple and shutoff valve in strainer blow down connection, full size of connection, except for strainers $\frac{3}{4}$ " and smaller installed ahead of control valves feeding individual terminals. Where indicated, provide drain line from shutoff valve to plumbing drain, full size of blow down connection.
- 3.7 Locate Y-type strainers in supply line ahead of the following equipment, and elsewhere as indicated, if integral strainer is not included in equipment:
- Pumps
 - Temperature control valves.
 - Pressure reducing valves.
 - Temperature or pressure regulating valves.

END OF SECTION 230521

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 230523 – VALVES

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to the work of this section.
- 1.2 This section is a Division-23 Basic Materials and Methods section, and is part of each Division-22 and 23 section making reference to or requiring valves specified herein.
- 1.3 Extent of valves required by this section is indicated on drawings and/or specified in other Division-22 and 23 sections.
- 1.4 Quality Assurance:
 - 1.4.1 Valve Dimensions: For face-to-face and end-to-end dimensions of flanged or welding-end valve bodies, comply with ANSI B16.10.
 - 1.4.2 Valve Types: Provide valves of same type by same manufacturer.
 - 1.4.3 Valves for use in potable water system shall be lead free.
- 1.5 Approval Submittals: Submit product data, catalog cuts, specifications, and dimensioned drawings for each type of valve. Include pressure drop curve or chart for each type and size of valve. Submit valves with Division-22 or 23 section using the valves, not as a separate submittal. For each valve, identify systems where the valve is intended for use.

Gate Valves. Type GA.
Check Valves. Type CK.
Ball Valves. Type BA.
- 1.6 O&M Data Submittals: Submit a copy of approval submittals. Submit installation instructions, maintenance data and spare parts lists for each type of valve. Include this data in the O&M Manual.

2 PRODUCTS

- 2.1 General: Provide factory-fabricated valves recommended by manufacturer for use in service indicated. Provide valves of types and pressure ratings indicated; provide proper selection as determined by Installer to comply with specifications and installation requirements. Provide sizes as indicated, and connections which properly mate with pipe, tube, and equipment connections.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide valves of one of the producers listed for each valve type. The model numbers are listed for contractor's convenience only. In the case of a model number discrepancy, the written description shall govern.
- 2.3 Gate Valves:

2.3.1 Packing: Select valves designed for repacking under pressure when fully opened, equipped with non-asbestos packing suitable for intended service. Select valves designed so back seating protects packing and stem threads from fluid when valve is fully opened, and equipped with gland follower.

2.3.2 Comply with the following standards:

Cast Iron Valves: MSS SP-70. Cast Iron Gate Valves, Flanged and Threaded Ends.

Bronze Valves: MSS SP-80. Bronze Gate, Globe, Angle and Check Valves.

Steel Valves: ANSI B16.34. Steel Standard Class Valve Ratings.

2.3.3 Types of gate (GA) valves:

- 1 Threaded Ends 2" and Smaller (GA1): Class 125, bronze body, screwed bonnet, rising stem, solid wedge. Stockham B-100. Nibco T-111. Crane 428. Milwaukee 148.
- 2 Soldered Ends 2" and Smaller (GA2): Class 125, bronze body, screwed bonnet, non-rising stem, solid wedge. Stockham B-108 or B-109. Nibco S-111. Crane 1334. Milwaukee 149.
- 3 Flanged Ends 2½" and Larger (GA3): Class 125, iron body, bronze mounted, bolted bonnet, rising stem, OS&Y, solid wedge. Stockham G-623. Nibco F617-0. Crane 465½. Milwaukee F2885.
- 4 Threaded Ends 2" and Smaller (GA4): Class 150, bronze body, screwed bonnet, rising stem, solid wedge. Stockham B-122. Nibco T-131. Crane 431. Milwaukee 1150.
- 5 Soldered Ends 2" and Smaller (GA5): Class 150, bronze body, screwed bonnet, rising stem, solid wedge. Stockham B-124. Nibco S-134. Milwaukee 1169.
- 6 Threaded Ends 2" and Smaller (GA6): 175 WWP, bronze body, screwed bonnet, rising stem, OS&Y, solid wedge, UL-listed. Stockham B-133. Nibco T-104-0.
- 7 Flanged Ends 2½" and Larger (GA7): 175 WWP, iron body, bolted bonnet, rising stem, OS&Y, solid wedge, UL listed. Stockham G-634. Nibco F-607-0TS
- 8 Threaded Ends 2" and Smaller (GA8): Class 200, bronze body, union bonnet, rising stem, solid wedge, renewable seat. Stockham B-132. Nibco T-154-SS. Milwaukee 1174.
- 9 Flanged Ends 2½" and Larger (GA9): Class 250, iron body bronze mounted, bolted bonnet, rising stem, OS&Y, solid wedge. Stockham F-667. Nibco F-667-0. Crane 7½E. Milwaukee F-2894.
- 10 Threaded Ends 2" and Smaller (GA10): Class 300, bronze body, union bonnet, rising stem, solid wedge, renewable seat. Stockham B-145. Nibco T-174-SS. Crane 634E. Milwaukee 1184.
- 11 Flanged Ends 2½" and Larger (GA11): Class 300, cast steel body, bolted bonnet, rising stem, solid wedge, seal-welded seat rings. Provide trim to match use. Stockham 30-0F. Crane 33.
- 12 Flanged Ends 2½" and Larger (GA12): 300 WWP, iron body, bolted bonnet, bronze mounted, rising stem, OS&Y, solid wedge, UL-listed. Stockham F-670. Nibco F-697-0.

2.4 Check Valves:

2.4.1 Construction: Construct valves of castings free of any impregnating materials. Construct valves with a bronze regrinding disc with a seating angle of 40° to 45°, unless a composition disc is specified. Provide stop plug as renewable stop for disc hanger, unless otherwise specified. Disc and hanger shall be separate parts with disc free to rotate. Support hanger pins on both ends by removable side plugs.

2.4.2 Comply with the following standards:

Cast Iron Valves: MSS SP-71. Cast Iron Swing Check Valves, Flanged and Threaded Ends.

Bronze Valves: MSS SP-80. Bronze Gate, Globe, Angle and Check Valves.

Steel Valves: ANSI B16.34. Steel Standard Class Valve Ratings.

2.4.3 Types of check (CK) valves:

- 1 Threaded Ends 2" and Smaller (CK1): Class 125, bronze body, screwed cap, horizontal swing, bronze disc. Stockham B-319. Nibco T-413-BY. Crane 1707. Milwaukee 509.
- 2 Soldered Ends 2" and Smaller (CK2): Class 125, bronze body, screwed cap, horizontal swing, bronze disc. Stockham B-309. Nibco S-413-B. Crane 1707S. Milwaukee 1509.
- 3 Flanged Ends 2½" and Larger (CK3): Class 125, iron body, bronze-mounted, bolted cap, horizontal swing, cast-iron or composition disc. Stockham G-931 or G-932 as applicable. Nibco F918-B. Crane 373. Milwaukee F2974 as applicable.
- 4 Threaded Ends 2" and Smaller (CK4): 200 WWP, bronze body, screwed cap, horizontal swing, regrinding type bronze disc, for fire sprinkler use. Nibco KT-403-W.
- 5 Flanged Ends 2½" and Larger (CK5): 175 WWP, iron body, bolted cap, bronze mounted, composition disc, UL listed, with ball drip if required. Stockham G-940. Nibco F-908-W.
- 6 Threaded Ends 2" and Smaller (CK6): Class 200, bronze body, screwed cap, Y-pattern swing, regrinding bronze disc. Stockham B-345. Nibco T-453-B. Crane 36. Milwaukee 518/508.
- 7 Flanged Ends 2½" and Larger (CK7): Class 250, iron body, bronze mounted, bolted cap, cast-iron disc. Stockham F-947. Nibco F-968-B. Crane 39E. Milwaukee F2970.
- 8 Threaded Ends 2" and Smaller (CK8): Class 300, bronze body, screwed cap, Y-pattern swing, regrinding bronze disc. Stockham B-375. Nibco T-473-B. Crane 76E. Milwaukee 517/507.
- 9 Flanged Ends 2½" and Larger (CK9): Class 300, cast steel body, bolted cap, horizontal swing, seal welded seat rings, chromium stainless disc. Stockham 30-SF. Crane 159.

2.5 Ball Valves:

2.5.1 General: Select with port area equal to or greater than connecting pipe area, include seat ring designed to hold sealing material.

2.5.2 Construction: Ball valves shall be rated for 150 psi saturated steam and 600 psi non-shock cold water. Pressure containing parts shall be constructed of ASTM B-584 alloy 844, or ASTM B-124 alloy 377.

Valves shall be furnished with blow-out proof bottom loaded stem constructed of ASTM B-371 alloy 694 or other approved low zinc material. Provide TFE packing, TFE thrust washer, chrome-plated ball and reinforced teflon seats. Valves 1" and smaller shall be full port design. Valves 1¼" and larger shall be conventional port design. Stem extensions shall be furnished for use in insulated piping where insulation exceeds ½" thickness.

2.5.3 Comply with the following standards:

MSS SP-72. Ball Valves with Flanged or Butt Welding Ends for General Service.

MSS SP-110. Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

2.5.4 Types of ball (BA) valves:

- 1 Threaded Ends 2" and Smaller (BA1): Bronze two-piece full port body with adjustable stem packing, stainless steel ball, trim, and handle. Nibco T-585-66. Stockham T285-BR-R-T. Milwaukee BA100S. Apollo 77-100.
- 2 Soldered Ends 2" and Smaller (BA2): Bronze three-piece full port body with adjustable stem packing. Nibco S-595-Y-66. Milwaukee BA350. Apollo 82-200.
- 3 Threaded Ends 1" and Smaller (BA3): Bronze two-piece full port body, UL listed (UL 842) for use with flammable liquids and LP gas. Nibco T-585-70-UL.
- 4 Threaded Ends 2" and Smaller (BA4): 175 WWP, bronze two-piece body, UL listed for fire protection service. Nibco KT-585-70-UL and KT-580-70-UL.
- 5 Threaded Ends 2" and Smaller (BA5): 400 WWP, bronze two-piece body, for fire protection service. Nibco KT-580.
- 6 Threaded Ends 2½" and Smaller (BA6): 300 WWP, bronze three-piece body, gear operator with handwheel, indicator flag, accepts tamper switch, for fire protection, UL listed. Nibco T-505-4 and G-505-4.
- 7 Flanged Ends 2½" and Larger (BA7): Class 150, carbon steel full bore two-piece body with adjustable stem packing, stainless steel ball, trim, and handle. Nibco F515-S6 series. Apollo 88A-240.

2.6 Valve Features:

2.7.1 General: Provide valves with features indicated and, where not otherwise indicated, provide proper valve features as determined by Installer for installation requirements. Comply with ANSI B31.1

2.7.2 Valve features specified or required shall comply with the following:

- 1 Flanged: Provide valve flanges complying with ANSI B16.1 (cast iron), ANSI B16.5 (steel), or ANSI B16.24 (bronze).
- 2 Threaded: Provide valve ends complying with ANSI B2.1.

- 3 Solder-Joint: Provide valve ends complying with ANSI B16.18.
- 4 Trim: Fabricate pressure-containing components of valve, including stems (shafts) and seats from brass or bronze materials, of standard alloy recognized in valve manufacturing industry unless otherwise specified.
- 5 Non-Metallic Disc: Provide non-metallic material selected for service indicated in accordance with manufacturer's published literature.
- 6 Renewable Seat: Design seat of valve with removable disc, and assemble valve so disc can be replaced when worn.
- 7 Extended Stem: Increase stem length by 2" minimum, to accommodate insulation applied over valve.

3 EXECUTION

3.1 Installation:

- 3.1.1 General: Install valves where required for proper operation of piping and equipment, including valves in branch lines to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward below horizontal plane.
- 3.1.2 Insulation: Where insulation is indicated, install extended-stem valves, arranged in proper manner to receive insulation.
- 3.1.3 Applications Subject to Corrosion: Do not install bronze valves and valve components in direct contact with steel, unless bronze and steel are separated by dielectric insulator.
- 3.1.4 Mechanical Actuators: Install mechanical actuators as recommended by valve manufacturer.
- 3.2 Selection of Valve Ends (Pipe Connections): Except as otherwise indicated, select and install valves with the following ends or types of pipe/tube connections:
 - 3.2.1 Tube Size 2" and Smaller: Threaded valves.
 - 3.2.2 Pipe Size 2" and Smaller: Threaded valves.
 - 3.2.3 Pipe Size 2½" and Larger: Flanged valves.
- 3.3 Non-Metallic Disc: Limit selection and installation of valves with non-metallic disc to locations indicated and where foreign material in piping system can be expected to prevent tight shutoff of metal seated valves.
- 3.4 Renewable Seats: Select and install valves with renewable seats, except where otherwise indicated.
- 3.5 Installation of Check Valves: Install in horizontal position with hinge pin horizontally perpendicular to center line of pipe. Install for proper direction of flow.

END OF SECTION 230523

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 230529 – SUPPORTS, ANCHORS, AND SEALS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-23 Basic Materials and Methods section, and is a part of each Division-22 and 23 section making reference to or requiring supports, anchors, and seals specified herein.
- 1.3 Extent of supports, anchors, and seals required by this section is indicated on drawings and/or specified in other Division-22 and 23 sections.
- 1.4 Code Compliance: Comply with applicable codes pertaining to product materials and installation of supports, anchors, and seals.
- 1.5 MSS Standard Compliance:
 - 1.5.1 Provide pipe hangers and supports of which materials, design, and manufacture comply with ANSI/MSS SP-58.
 - 1.5.2 Select and apply pipe hangers and supports, complying with MSS SP-69.
 - 1.5.3 Fabricate and install pipe hangers and supports, complying with MSS SP-89.
 - 1.5.4 Terminology used in this section is defined in MSS SP-90.
- 1.6 UL Compliance: Provide products which are Underwriters Laboratories listed .

2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide supports and hangers by Grinnel, Michigan Hanger Company, B-Line Systems, or approved equal.
- 2.2 Horizontal-Piping Hangers and Supports: Except as otherwise indicated, provide factory-fabricated horizontal-piping hangers and supports complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal-piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems.
 - 2.2.1 Adjustable Steel Clevises: MSS Type 1.
 - 2.2.2 Steel Double Bolt Pipe Clamps: MSS Type 3.
 - 2.2.3 Adjustable Steel Band Hangers: MSS Type 7.
 - 2.2.4 Steel Pipe Clamps: MSS Type 4.

- 2.2.5 Pipe Stanchion Saddles: MSS Type 37, including steel pipe base support and cast-iron floor flange.
- 2.2.6 Single Pipe Rolls: MSS Type 41.
- 2.2.7 Adjustable Roller Hanger: MSS Type 43.
- 2.2.8 Pipe Roll Stands: MSS Type 44 or Type 47.
- 2.3 Vertical-Piping Clamps: Except as otherwise indicated, provide factory-fabricated vertical-piping clamps complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit vertical piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of vertical piping clamps to exactly fit pipe size of bare pipe. Provide copper-plated clamps for copper-piping systems.
 - 2.3.1 Two-Bolt Riser Clamps: MSS Type 8.
 - 2.3.2 Four-Bolt Riser Clamps: MSS Type 42.
- 2.4 Hanger-Rod Attachments: Except as otherwise indicated, provide factory-fabricated hanger-rod attachments complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit horizontal-piping hangers and building attachments, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hanger-rod attachments to suit hanger rods. Provide copper-plated hanger-rod attachments for copper-piping systems.
 - 2.4.1 Steel Turnbuckles: MSS Type 13.
 - 2.4.2 Malleable Iron Sockets: MSS Type 16.
- 2.5 Building Attachments: Except as otherwise indicated, provide factory-fabricated building attachments complying with ANSI/MSS SP-58, of one of the following MSS types listed, selected by Installer to suit building substrate conditions, in accordance with MSS SP-69 and manufacturer's published product information. Select size of building attachments to suit hanger rods.
 - 2.5.1 Center Beam Clamps: MSS Type 21.
 - 2.5.2 C-Clamps: MSS Type 23.
 - 2.5.3 Malleable Beam Clamps: MSS Type 30.
 - 2.5.4 Side Beam Brackets: MSS Type 34.
 - 2.5.5 Concrete Inserts: MSS Type 18.
- 2.6 Saddles and Shields: Except as otherwise indicated, provide saddles or shields under piping hangers and supports, factory-fabricated, for all insulated piping. Size saddles and shields for exact fit to mate with pipe insulation.
 - 2.6.1 Protection Shields: MSS Type 40; of length recommended by manufacturer to prevent crushing of insulation.

- 2.6.2 Protection Saddles: MSS Type 39; use with rollers, fill interior voids with segments of insulation matching adjoining insulation.
- 2.7 Miscellaneous Materials:
- 2.7.1 Metal Framing: Provide products complying with NEMA STD ML 1.
- 2.7.2 Steel Plates, Shapes and Bars: Provide products complying with ANSI/ASTM A 36.
- 2.7.3 Cement Grout: Portland cement (ANSI/ASTM C 150, Type I or Type III) and clean uniformly graded, natural sand (ANSI/ASTM C 404, Size No. 2). Mix at a ratio of 1.0 part cement to 3.0 parts sand, by volume, with minimum amount of water required for placement and hydration.
- 2.7.4 Heavy-Duty Steel Trapezes: Fabricate from steel shapes or continuous channel struts selected for loads required; weld steel in accordance with AWS standards.
- 3 EXECUTION
- 3.1 Preparation
- 3.1.1 Proceed with installation of hangers, supports and anchors only after required building structural work has been completed in areas where the work is to be installed. Correct inadequacies including (but not limited to) proper placement of inserts, anchors and other building structural attachments.
- 3.1.2 Prior to installation of hangers, supports, anchors and associated work, Installer shall meet at project site with Contractor, installer of each component of associated work, and installers of other work requiring coordination with work of this section for purpose of reviewing material selections and procedures to be followed in performing the work in compliance with requirements specified.
- 3.2 Installation of Building Attachments:
- 3.2.1 Install building attachments at required locations within concrete or on structural steel for proper piping support. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert securely to forms. Where concrete with compressive strength less than 2500 psi is indicated, install reinforcing bars through openings at top of inserts.
- 3.2.2 In areas of work requiring attachments to existing concrete, use self drilling rod inserts, Phillips Drill Co., "Red-Head" or equal.
- 3.3 Installation of Hangers and Supports:
- 3.3.1 General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with MSS SP-69. Arrange for grouping of parallel runs of horizontal piping to be supported together on trapeze type hangers where possible. Install supports with maximum spacings complying with MSS SP-69 or as listed herein, whichever is most limiting. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install

intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.

- 3.3.1.1 Horizontal steel pipe and copper tube 1-1/4" diameter and smaller: support on 6 foot centers.
- 3.3.1.2 Horizontal steel pipe and copper tube 1-1/2" diameter and larger: support on 10 foot centers.
- 3.3.1.3 Vertical steel pipe and copper tube: support at each floor.
- 3.3.1.4 Plastic pipe: support in accordance with manufacturer's recommendations and the Florida Building Code, Plumbing.
- 3.3.2 Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories.
- 3.3.3 Paint all black steel hangers with black enamel. Galvanized steel and copper clad hangers do not require paint.
- 3.3.4 Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated, or by other recognized industry methods.
- 3.3.5 Provision for Movement:
 - 3.3.5.1 Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
 - 3.3.5.2 Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
 - 3.3.5.3 Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 are not exceeded.
- 3.3.6 Insulated Piping: Comply with the following installation requirements.
 - 3.3.6.1 Shields: Where low-compressive-strength insulation or vapor barriers are indicated, install coated protective shields.
 - 3.3.6.2 Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ANSI B31.
- 3.4 Installation of Anchors:
 - 3.4.1 Install anchors at proper locations to prevent stresses from exceeding those permitted by ANSI B31, and to prevent transfer of loading and stresses to connected equipment.
 - 3.4.2 Fabricate and install anchors by welding steel shapes, plates and bars to piping and to structure. Comply with ANSI B31 and with AWS standards.

- 3.4.3 Anchor Spacings: Where not otherwise indicated, install anchors at ends of principal pipe-runs, at intermediate points in pipe-runs between expansion loops and elbows. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.
- 3.4.4 Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions to limit movement of piping and forces to maximums recommended by manufacturer for each unit.
- 3.5 Equipment Bases:
- 3.5.1 Provide concrete housekeeping bases for all floor mounted equipment furnished as part of the work of Division 23. Size bases to extend minimum of 4" beyond equipment base in any direction; and 4" above finished floor elevation. Construct of reinforced concrete, roughen floor slab beneath base for bond, and provide steel rod anchors between floor and base. Locate anchor bolts using equipment manufacturer's templates. Chamfer top and edge corners.
- 3.5.2 Provide structural steel stands to support equipment not floor mounted or hung from structure. Construct of structural steel members or steel pipe and fittings. Provide factory-fabricated tank saddles for tanks mounted on steel stands. Prime and paint with black enamel.

END OF SECTION 230529

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 230548 – VIBRATION ISOLATION

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-23 Basic Mechanical Materials and Methods section, and is part of each Division-23 section making reference to vibration isolation equipment.
- 1.3 Extent of vibration isolation required by this section is indicated on drawings and/or specified in other Division-23 sections.
- 1.4 Approval Submittals: When required by other Division-23 sections, submit product data sheets for each type of vibration isolation equipment including configuration and rating data. Submit with Division-23 section using vibration isolation, not as a separate submittal. Provide calculations showing supported weight, deflection, and isolator size and type for each item of supported equipment. Submit for:

Equipment Mountings. Type EM.
Hangers. Type HA.
- 1.5 O&M Data Submittals: Submit a copy of approval submittals for each type of vibration isolation equipment. Include this data in O&M Manual.

2 PRODUCTS

- 2.1 General: Provide factory-fabricated products recommended by manufacturer for use in service indicated. Provide products of types and deflections indicated; provide proper selection as determined by Installer to comply with specifications and installation requirements. Provide sizes which properly fit with equipment. All metal parts installed outside shall be hot dipped galvanized after fabrication.
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide vibration isolation equipment of: Mason Industries, Keflex, Consolidated Kinetics, Vibration Mountings & Controls, Wheatley or approved equal. All vibration isolators shall be supplied by a single approved manufacturer.
- 2.3 Equipment Mountings:
 - 2.3.1 Select mountings with the required deflection and fastening means. Provide steel rails or bases as required to compensate for equipment rigidity and overhang.
 - 2.3.2 Types of equipment mountings (EM):
 - 1 Spring Mountings (EM1): Spring isolators shall be free-standing and laterally stable without any housing. All mounts shall have leveling bolts. Spring diameter shall be not less than 0.8 of the compressed height of the spring at rated load. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Springs shall be so designed that the ratio of horizontal stiffness to vertical stiffness is approximately one. Provide a nominal static deflection

of at least 1.0". Basis of Design: Mason Industries SLFH.

- 2 Spring Mountings with Housings (EM2): Spring isolators shall consist of open, stable steel springs and include vertical travel limit stops to control extension when weight is removed. The housing of the spring unit shall serve as blocking during erection of equipment. Provide a nominal static deflection of at least 1.0". All mountings used outside shall be hot dipped galvanized. Basis of Design: Mason Industries SLR.
- 3 Spring Mountings with Housings (EM3): Spring isolators shall consist of open, stable steel springs with neoprene inserts to limit movement between upper and lower housing on start and stop. Provide a nominal static deflection of at least 1.0". Mountings shall be specifically designed for critical areas on light-weight floors. Basis of Design: Mason Industries C.
- 4 Neoprene Mountings (EM4): Double deflection neoprene-in-shear mountings shall have a minimum static deflection of 0.35". All metal surfaces shall be neoprene covered. The top and bottom surfaces shall be neoprene ribbed and bolt holes shall be provided in the base. Basis of design: Mason Industries ND.
- 5 Pads (EM5): Waffle or ribbed pattern neoprene pads shall be fabricated from 40-50 durometer neoprene. Provide rigid steel plate and mounting angles as required. Basis of design: Mason Industries Super W.

2.4 Hangers:

2.4.1 Select hangers with the required deflection. Provide all required hanger rods and fasteners.

2.4.2 Types of hangers (HA):

- 1 Hangers (HA1): Vibration hangers shall contain a steel spring set in a neoprene cup manufactured with a grommet to prevent short-circuiting of the hanger rod. The cup shall contain a steel washer designed to properly distribute the load on the neoprene and prevent its extrusion. Spring diameters and hanger box lower-hole sizes shall be large enough to permit the hanger rod to swing through a 30-degree arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Basis of Design: Mason Industries 30.
- 2 Hangers (HA2): Vibration hangers shall contain a laterally stable steel spring and 0.3" deflection neoprene or fiberglass element in series. A neoprene neck shall be provided where the hanger rod passes through the steel box supporting the isolator mount to prevent metal to metal contact. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30 degree arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Basis of Design: Mason Industries 30N.
- 3 Hangers (HA3): Double deflection neoprene-in-sheer or EPDM hangers. Units shall be complete with projected neoprene bushing to prevent steel-to-steel contact between hanger box and hanger rod. Average static deflection shall be not less than 0.4 inches. Basis of Design: Mason Industries HD.

3 EXECUTION

- 3.1 Install vibration isolation devices for the duty indicated and for ease of inspection, adjustment, and proper operation. Install in accordance with the manufacturer's written instructions and coordinate with shop drawings of supported equipment.
- 3.2 All connections to fixtures and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.
- 3.3 Piping, ductwork and conduit shall not be suspended from one another or physically contact one another. Vibrating systems shall be kept free from non-vibrating systems.
- 3.4 Equipment Mountings:
 - 3.4.1 Unless otherwise shown or specified, all floor-mounted equipment shall be set on housekeeping equipment bases. Refer to Division-23 section "Supports, Anchors, and Seals".
 - 3.4.2 No equipment unit shall bear directly on vibration isolators unless its own frame is suitably rigid to span between isolators, and such direct support is approved by the equipment manufacturer. All support frames shall be sufficiently stiff and rigid so as to prevent distortion and misalignment of components installed thereon.
 - 3.4.3 Align equipment mountings for a free, plumb installation. Isolators that are binding, offset or fully compressed will not be accepted.
- 3.5 Hangers:
 - 3.5.1 Position vibration isolation hangers so that hanger housing may rotate a full 360 degrees without contacting any object.
 - 3.5.2 Install steel angles, channels, rods and fasteners to level equipment, piping or ductwork and to evenly distribute the supported weight.
- 3.6 Connections of Ducts: Ducts shall be connected to fan intakes and discharges by means of flexible connectors in accordance with Division-23 section "Ductwork Accessories" so that all vibrating equipment is fully isolated.

END OF SECTION 230548

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 230553 – MECHANICAL IDENTIFICATION

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-23 Basic Mechanical Materials and Methods section, and is part of each Division-22 and 23 section making reference to or requiring identification devices specified herein.
- 1.3 Extent of mechanical identification work required by this section is indicated on drawings and/or specified in other Division-22 and 23 sections.
- 1.4 Refer to Division-26 sections for identification requirements of electrical work; not work of this section. Refer to other Division-23 sections for identification requirements for controls; not work of this section.
- 1.5 Codes and Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

2 PRODUCTS

- 2.1 General: Provide manufacturer's standard products of categories and types required for each application as referenced in other Division-22 and 23 sections. Where more than single type is specified for application, selection is Installer's option, but provide single selection for each product category.
- 2.2 Painted Identification Materials
 - 2.2.1 Stencils: Standard fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendations of ANSI A13.1 for piping and similar applications, but not less than 1-¼" high letters for ductwork and not less than ¾" high letters for access door signs and similar operational instructions.
 - 2.2.2 Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray-can form and grade.
 - 2.2.3 Identification Paint: Standard identification enamel.
- 2.3 Plastic Pipe Markers
 - 2.3.1 Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers.
 - 2.3.1.1 Lettering: Manufacturer's standard pre-printed nomenclature which best describes piping system in each instance, as selected by Architect/Engineer in cases of variance with name as shown or specified.
 - 2.3.1.2 Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as separate unit of plastic.

2.4 Valve Tags:

2.4.1 Brass Valve Tags: Provide 19-gage polished brass valve tags with stamp-engraved piping system abbreviation in ¼" high letters and sequenced valve numbers ½" high, and with 5/32" hole for fastener. Provide 1-½" diameter tags, except as otherwise indicated.

2.4.2 Plastic Laminate Valve Tags: Provide manufacturer's standard 3/32" thick engraved plastic laminate valve tags, with piping system abbreviation in ¼" high letters and sequenced valve numbers ½" high, and with 5/32" hole for fastener. Provide 1-½" square black tags with white lettering, except as otherwise indicated.

2.5 Engraved Plastic-Laminate Signs:

2.5.1 General: Provide engraving stock melamine plastic laminate, in the sizes and thicknesses indicated, engraved with engraver's standard letter style a minimum of 3/4" tall and wording indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.

2.5.2 Thickness: 1/16" for units up to 20 sq. in. or 8" length; 1/8" for larger units.

2.5.3 Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

2.6 Stamped Nameplates: Provide equipment manufacturer's standard stamped nameplates for motors, AHUs, pumps, etc.

3 EXECUTION

3.1 Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.2 Ductwork Identification:

3.2.1 General: Identify air supply, return, exhaust, intake and relief ductwork with stenciled signs and arrows, showing ductwork service and direction of flow, in black or white. Example: **AHU-1 Supply**
➔

3.2.2 Location: In each space where ductwork is exposed, or concealed only by removable ceiling system, locate signs near points where ductwork originates or continues into concealed enclosures, and at 50' spacings along exposed runs.

3.2.3 Access Doors: Provide stenciled signs on each access door in ductwork and housings, indicating purpose of access (to what equipment) and other maintenance and operating instructions, and appropriate and procedural information.

3.3 Piping System Identification:

- 3.3.1 General: Install pipe markers of one of the following types on each system indicated to receive identification, and include arrows to show normal direction of flow:
 - 3.3.1.1 Plastic pipe markers.
 - 3.3.1.2 Stenciled markers, black or white for best contrast.
- 3.3.2 Locate pipe markers as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces and exterior non-concealed locations.
 - 3.3.2.1 Near each valve and control device.
 - 3.3.2.2 Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.
 - 3.3.2.3 Near locations where pipes pass through walls, floors, ceilings, or enter non-accessible enclosures.
 - 3.3.2.4 At access doors, manholes and similar access points which permit view of concealed piping.
 - 3.3.2.5 Near major equipment items and other points of origination and termination.
 - 3.3.2.6 Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.
 - 3.3.2.7 On piping above removable acoustical ceilings, except omit intermediately spaced markers.
- 3.4 Mechanical Equipment Identification: Install engraved plastic laminate sign on a vertical surface on or near each major item of mechanical equipment and each operational device. Label shall indicate type of system and area served. Provide signs for the following general categories of equipment and operational devices:
 - 3.4.1 Main control and operating valves, including safety devices.
 - 3.4.2 Meters, gauges, thermometers and similar units.
 - 3.4.3 Fuel-burning units including boilers, furnaces, and heaters.
 - 3.4.4 Pumps, compressors, chillers, condensers, and similar equipment.
 - 3.4.5 Heat exchangers, coils, evaporators, cooling towers, heat recovery units and similar equipment.
 - 3.4.6 Fans, blowers, primary balancing dampers and VAV boxes.
 - 3.4.7 HVAC air handlers and fan coil units.
 - 3.4.8 Air conditioning indoor and outdoor units.

- 3.5 Stamped Nameplates: Equipment manufacturers to provide standard stamped nameplates on all major equipment items such as motors, pumps, AHUs, etc. Where motors are hidden from view (within equipment casing, or otherwise not easily accessible, etc.), the equipment supplier shall furnish a duplicate motor data nameplate to be affixed to the equipment casing in an easily visible location, unless data is already included on the equipment nameplate.]
- 3.6 Adjusting and Cleaning:
- 3.6.1 Adjusting: Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.

END OF SECTION 230553

SECTION 230556 – ACCESS DOORS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-23 Basic Mechanical Materials and Methods section, and is part of each Division-22 and 23 section making reference to or requiring access panels specified herein.
- 1.3 Approval Submittals:
 - 1.3.1 Product Data: When required by other Division-22 or 23 sections, submit product data for access doors. Submit with Division-22 or 23 section using access doors, not as a separate submittal. Include rating data.
- 1.4 O&M Data Submittals: Submit a copy of approval submittal. Include this data in O&M Manuals.

2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide access doors by Milcor, Jay R. Smith, Zurn, BOICO, Elmdor, or approved equal.
- 2.2 General: Where floors, walls and ceilings must be penetrated for access to plumbing or mechanical work, provide types of access doors indicated. Furnish sizes indicated or, where not otherwise indicated, furnish adequate size for intended and necessary access. Furnish manufacturer's complete units, of type recommended for application in indicated substrate construction, in each case, complete with anchorages and hardware.
- 2.3 Access Door Construction: Except as otherwise indicated, fabricate wall/ceiling door units of welded stainless steel construction with welds ground smooth and brushed finish; 16-gauge frames and 14-gauge flush panel doors; 175° swing with concealed spring hinges; flush screw-driver-operated cam locks.

3 EXECUTION

- 3.1 Access doors shall be installed to operate and service all plumbing equipment including valves, dampers, duct access panels, and other items requiring maintenance that are concealed above or behind finished construction. Access doors shall be installed in walls, chase and floors as necessary, but are not required in accessible suspended ceiling systems.
- 3.2 Access doors shall be installed by the Division installing the substrate construction. However, responsibility for furnishing and determining location of access doors is part of this Division's work. The style of access door shall be suitable for construction into which installed.
- 3.3 Access doors shall be sized and located as required to provide proper maintenance and service access in accordance with the manufacturer's recommendations and code authority requirements for all devices and equipment.

END OF SECTION 230556

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 230573 – EXCAVATION AND BACKFILL

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-23 Basic Mechanical Materials and Methods section, and is part of each Division-22 and 23 section making reference to or requiring excavation and backfill specified herein.
- 1.3 Refer to other Division-22 and 23 sections and/or drawings for specific requirements of the particular piping system being installed. Where another Division-22 or 23 section or the drawings conflict with requirements of this section, the other Division-22 or 23 section or the drawings shall take precedence over the general requirements herein.
- 1.4 OSHA: Contractor employee worker protection for all trenching and excavation operations shall comply with 29 CFR 1926.650 Subpart P and all current OSHA requirements.
- 1.5 Trench Safety Act: Contractor shall comply with all requirements of Florida Statutes Chapter 553, including the requirement to provide a separate line item to identify the cost to comply on a per lineal foot of trench and per square foot of shoring.

2 PRODUCTS

- 2.1 Sand: Clean, hard, uncoated grains free from organic matter or other deleterious substances. Sand for backfill shall be of a grade equal to mortar sand.
- 2.2 Gravel: Clean, well graded hard stone or gravel, free from organic material. Size range to be from No. 4 screen retentions to 1".
- 2.3 Earth: Fill free of clay, muck, stones, wood, roots or rubbish.
- 2.4 Identification Tape: Polyethylene 6 inches wide, 0.004 inches thick, continuously printed with "CAUTION" in large letters and type of pipe below.
- 2.5 Copper Identification Wire: 14-gauge.

3 EXECUTION

- 3.1 Ditching and Excavation: Shall be performed by hand wherever there is a possibility of encountering obstacles or any existing utility lines of any nature whatsoever. Where clear and unobstructed areas are to be excavated, appropriate machine excavation methods may be employed. Avoid use of machine excavators within the limits of the building lines.
- 3.2 Bedding: Excavate to bottom grade of pipe to be installed, and shape bed of undisturbed earth to contour of pipe for a width of at least 50% of pipe diameter. If earth conditions necessitate excavation below grade of the pipe, such as due to the presence of clay, muck, or roots, subcut and bring bed up to proper elevation with clean, new sand (as described in paragraph 2.1), deposited in 6" layers and tamped. Notify Architect/Engineer if subcut exceeds 12", or if bed is of an unstable nature. In this case a 6" minimum layer of gravel will be required before sand bedding begins. Submit cost proposal

if the earth conditions require subcut in excess of 12" or if gravel is required to achieve proper bedding.

- 3.3 Placing: Pipe shall be carefully handled into place. Avoid knocking loose soil from the banks of the trench into the pipe bed. Rig heavier sections with nylon slings in lieu of wire rope to avoid crushing or chipping. Pipe which is handled with insulation in place, coated pipe, and jacketed pipe shall have special handling slings as required to prevent damage to the material.
- 3.4 Backfilling: Deposit clean new sand (as described in paragraph 2.1) to 6" above the pipe and tamp. Then deposit sand or earth carefully in 6" layers, maintaining adequate side support, especially on nonferrous piping materials. Compact fill in 6" layers, using mechanical means, up to the top elevation of the pipe, and in 12" layers to rough or finish grade as required. Fine grade and restore surface to original condition.
- 3.5 Special: Excavations shall be installed and maintained in satisfactory condition during the progress of the work. Subsurface structures are to be constructed in adequately sized excavations. De-watering equipment shall be installed and properly maintained where required. Shoring shall be employed in the event of unstable soil condition, and in all cases where required by OSHA regulations and necessary to protect materials and personnel from injury.
- 3.6 Identification: Install identification tape directly above all underground piping, one tape for each pipe where multiple pipes are installed. Depth of tape shall be at least 6 inches below finished grade and 24" above buried pipe. Install copper wire above non-metallic pipes.
- 3.7 Depth of Cover: Minimum cover for underground piping is two feet unless indicated otherwise.

END OF SECTION 230573

SECTION 230590 – START-UP REQUIREMENTS FOR HVAC SYSTEMS

1 GENERAL

- 1.1 Intent: It is the intent of this section to require that the startup requirements and report noted herein be performed prior to starting TAB work on each system. Work can be phased with permission of the Engineer.
- 1.2 Coordination:
 - 1.2.1 The Contractor shall furnish to the TAB Contractor a complete set of plans, specifications, addenda, shop drawings, equipment performance data sheets, change orders, etc. as requested by the TAB Contractor.
 - 1.2.2 The Contractor shall participate in a TAB coordination meeting to discuss interface requirements with the TAB Contractor and to establish a schedule for TAB work prior to start of TAB work. The TAB will be performed by an independent company contracted by the owner.
- 1.3 Test Reports and Verification Submittals:
 - 1.3.1 Submit Startup Report as described herein for each system. Attach Factory Startup Report for equipment as required by other Division-23 sections.

2 PRODUCTS: None

3 EXECUTION:

- 3.1 The TAB work shall not commence until the Engineer has received written notice from the Contractor that HVAC systems are 100% complete and are fully operational. Submit Startup Report as described herein.
- 3.2 The Contractor shall place all HVAC systems and equipment into complete operation during each working day of TAB work.
- 3.3 The Contractor shall provide access to HVAC systems and equipment by supplying ladders and/or scaffolding, and opening access panels and equipment room doors.
- 3.4 The TAB Contractor will provide to the Contractor TAB punch lists of non-complying HVAC work as they are discovered. The Contractor shall replace or repair non-complying work as soon as possible in order not to delay completion of TAB work.
- 3.5 Airside Systems: The Contractor shall provide the following information to the Engineer to substantiate proper start-up and preliminary adjustments of air handler units, belt driven fans, and duct systems.
 - 3.5.1 Verify that air grilles (supply, return, exhaust, transfer, outdoor, etc.) are installed and connected to the duct system.
 - 3.5.2 Verify that duct systems are clean of debris.

- 3.5.3 Verify that ducts attached with flexible connectors are aligned within ½" and have a uniform gap between ducts of 1"-1.5". Flexible connectors shall not leak and shall be insulated.
- 3.5.4 Verify that filters are clean and filter spacers are installed.
- 3.5.5 Verify that balancing dampers at grilles and branch ducts are operational and are fully opened.
- 3.5.6 Verify that fire and smoke dampers are correctly installed and are fully opened.
- 3.5.7 Verify that fan discharges are appropriate for the outlet ductwork with regards to the "system effect" per AMCA Publication 201. Inappropriate fan discharges will not be accepted.
- 3.5.8 Verify proper fan rotation.
- 3.5.9 Verify proper belt drive alignment.
- 3.5.10 Verify fan motor overload elements are correctly sized.
- 3.5.11 Adjust fan sheave until CFM is at or above design CFM. Provide additional sheaves and belts as required. Verify that motor is not overloaded.
- 3.5.12 Verify that HVAC control systems are fully operational.
- 3.6 Startup Report: The Contractor shall submit the startup information required by this section to the Engineer in a typed report organized as outlined herein. The Startup Report is required to meet the written notice described herein prior to starting TAB work. TAB work will not start until the Startup Report has been submitted and approved.

END OF SECTION 230590

SECTION 230591 – TESTING, CLEANING, AND STERILIZATION OF PIPING SYSTEMS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 This section is a Division-23 Basic Mechanical Materials and Methods section, and is part of each Division-22 and 23 section making reference to or requiring the testing and other procedures specified herein.
- 1.3 Notify the Architect/Engineer when system tests are ready to be witnessed at least 24 hours prior to the test.
- 1.4 All materials, test equipment, and devices required for cleaning, testing, sterilizing or purging shall be provided by the Contractor.

2 PRESSURE TESTS

- 2.1 General: Provide temporary equipment for testing, including pump and gauges. Test piping systems before insulation is installed wherever feasible, and remove control devices before testing. Test each natural section of each piping system independently but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating. Fill each section with indicated medium and pressurize for indicated pressure and time.
- 2.2 Required test period is four hours.
- 2.3 No piping, fixtures, or equipment shall be concealed or covered until they have been tested. The contractor shall apply each test and ensure that it is satisfactory for the period specified before calling the Architect/Engineer to observe the test. Test shall be repeated upon request to the satisfaction of those making the inspection.
- 2.4 Observe each test section for leakage at the end of the test period. Test fails if leakage is observed or if pressure drop exceeds 5% of the test pressure.
- 2.5 Check of systems during application of test pressures should include visual check for water leakage and soap bubble or similar check for air and nitrogen leakage.
- 2.6 During heating and cooling cycles, linear expansion shall be checked at all elbows and expansion joints for proper clearance.
- 2.7 Repair piping systems sections which fail required piping test. Disassemble and re-install using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.
- 2.8 Pressure Test Requirements:
 - 2.8.1 Soil, Waste, and Vent Test all piping within the building with a 10 foot head of water. Test piping in sections so that all joints are tested. Provide test tees as required.

- 2.8.2 Domestic Water: Perform hydrostatic test on all piping within the building at twice the normal static pressure at service point, but not less than 100 psig. Once tested, flush out piping and leave under pressure of the supply main or 40 psig for the balance of the construction period.

3 CLEANING AND STERILIZATION

- 3.1 General: Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of specified coatings (if any). Flush out piping systems with clean water or blowdown with air before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.
- 3.2 Flush and drain all water systems at least three times. Reverse flush systems from smallest piping to largest piping. Replace startup strainers with operating strainers.
- 3.3 Sterilization of Domestic Water Systems:
- 3.3.1 Prerequisites: All new hot and cold water piping installed (complete), all fixtures connected, system flushed out, and system filled with water.
- 3.3.2 The shut off valve at the water main shall be closed, all fixture outlets opened slightly, and a sterilizing solution shall be introduced at a manifold connection installed by the Contractor at the meter.
- 3.3.3 The solution shall contain 50 parts per million of available chlorine. The chlorinating material shall be either liquid chlorine or calcium hypochlorite. The solution shall be allowed to stand in the system for at least eight hours after which the entire system shall be flushed.
- 3.3.4 After final flushing, all aerators shall be removed, cleaned, and reinstalled. After final flush the residual chlorine shall not exceed 0.2 parts per million.
- 3.3.5 The Architect/Engineer shall be notified 24 hours prior to the procedure so that it can be witnessed.
- 3.3.6 Provide sampling and certified report by an independent testing lab. Provide written Health Department approval of disinfection samples.

END OF SECTION 230591

SECTION 230593 – TESTING AND BALANCING OF MECHANICAL SYSTEMS

1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section. Division-23 Basic Mechanical Materials Sections apply to work of this section.

1.2 Description of Work:

A. Extent of testing, adjusting, and balancing work (TAB) is indicated by requirements of this section, and also by drawings and schedules, and is defined to include, but is not necessarily limited to, air distribution systems, hydronic distribution systems and associated equipment and apparatus of mechanical work. The work consists of setting speed and volume (flow) adjusting facilities provided for systems, recording data, conducting tests, preparing and submitting reports, and recommending modifications to work as required.

B. Coordination: Coordinate with the General Contractor and Mechanical Contractor responsible for the HVAC system installation as required to complete the TAB work.

1.3 The intent of this specification is to balance HVAC systems within the tolerances listed, maintaining the pressure relationships indicated, with a minimum of noise.

A. Airflow Tolerances:

1. Air Handling: The supply air, return air and outdoor air quantities shall be balanced within $\pm 5\%$ of design values.

2. Exhaust Fans: The exhaust fan quantities shall be set as required to maintain the design exhaust terminal flows within $\pm 5\%$ of design values. If no exhaust terminals exist, exhaust fan air quantities shall be balanced within $\pm 10\%$ of design values.

3. Ceiling Diffusers, Supply Registers, Return and Exhaust Inlets: Balance to an air quantity within $\pm 10\%$ of the design values.

B. Temperature Tolerances:

1. Air Handling Temperatures: The controlled temperatures at AHUs shall be verified to be under control within $\pm 1^\circ\text{F}$ of design values.

2. Room Temperatures: Balance systems and controls within $\pm 2^\circ\text{F}$ of indicated settings.

C. Pressure Relationships: Where code or design indicates a specific pressure relationship, the pressure relationship shall take precedence over airflow tolerances. Airflow tolerances may need to be held tighter than allowed tolerances to meet pressure relationships. Demonstrate the existence of positive or negative pressure to Engineer and authority having jurisdiction by making direct measurements of room relative pressure and/or flow direction.

1.4 Quality Assurance: The TAB Contractor's main office shall be located within 125 miles of the project site and certified as one of the following:

- A. Tester: A firm certified by National Environmental Balancing Bureau (NEBB) in those testing and balancing disciplines required for this project, who is not the Installer of the systems to be tested and is otherwise independent of the project. Comply with NEBB's "Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems" as applicable to this work.
- B. Tester: A firm certified by Associated Air Balance Council (AABC) in those testing and balancing disciplines required for this project. AABC-certified firms are independent by definition. Comply with AABC's Manual MN-1 "AABC National Standards", as applicable to this work.
- C. Industry Standards: Comply with American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) recommendations pertaining to measurements, instruments and testing, adjusting and balancing, except as otherwise indicated.

1.5 Job Conditions:

- A. Do not proceed with testing, adjusting, and balancing work until HVAC work (including Controls) has been completed and is operable. Ensure that there is no residual work still to be completed.
- B. Do not proceed until work scheduled for testing, adjusting, and balancing is clean and free from debris, dirt and discarded building materials.
- C. Do not proceed until architectural work that would affect balancing (walls, ceiling, windows, doors) have been installed.
- D. Testing may proceed system by system, but each HVAC system must be complete as describe herein.
- E. The mechanical contractor shall make any changes in pulleys, belts, and dampers, and/or add dampers as required for correct balancing.

1.6 Approval Submittals

- A. Submit the name of the proposed test and balance company for the Engineer's approval within thirty (30) days after awarding of contract.

1.7 Test Reports and Verification Submittals:

- A. Submit four (4) copies of the dated test and balance report upon completion of TAB work. The report shall include a list of instruments used for the work. The report shall be signed by the supervisor who performed the TAB work.

2 PRODUCTS

- 2.1 Patching Materials: Except as otherwise indicated, use same products as used by original Installer for patching holes in insulation, ductwork and housings which have been cut or drilled for test purposes, including access for test instruments, attaching jigs, and similar purposes.

- 2.2 Test Instruments: Utilize test instruments and equipment of the type, precision, and capacity as recommended in the referenced standard. All instruments shall be in good condition and shall have been calibrated within the previous six (6) months (or more recently if required by standard).

3 EXECUTION

3.1 General:

- A. Examine installed work and conditions under which testing is to be done to ensure that work has been completed, cleaned and is operable. Do not proceed with TAB work until unsatisfactory conditions have been corrected in manner acceptable to Tester.
- B. Test, adjust and balance environmental systems and components, as indicated, in accordance with procedures outlined in applicable standards, and as modified or detailed herein.
- C. Test, adjust and balance systems during summer season for air conditioning systems and during winter season for heating systems, including at least a period of operation at outside conditions within 5°F wet bulb temperature of maximum summer design condition, and within 10°F dry bulb temperature of minimum winter design condition. When seasonal operation does not permit measuring final temperatures, then take final temperature readings when seasonal operation does permit. The Contractor shall return for a change of seasons test at no additional cost to the Owner and submit the revised TAB report.
- D. Punch List: Prepare a deficiency (punch)list for the Contractor with a copy of the Engineer that lists all items that are incorrectly installed or are functioning improperly. Provide a retest after all items are corrected.
- E. Prepare TAB report of test results, including instrumentation calibration reports, in format recommended by applicable standards, modified as required to include all data listed herein.
- F. Patch holes in insulation, ductwork and housings, which have been cut or drilled for test purposes, in manner recommended by original Installer.
- G. Mark equipment settings, including damper control positions, valve indicators, fan speed control levers, and similar controls and devices, to show final settings at completion of TAB work. Provide markings with paint or other suitable permanent identification materials.
- H. Include in the TAB report recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.
- I. Include an extended warranty of ninety (90) days after completion of test and balance work, during which time the Engineer, at his discretion, may request a recheck, or resetting of any component as listed in test report. The TAB company shall provide technicians and instruments and make any tests required by the Engineer during this time period.

3.2 Controls

- A. Check all HVAC controls for proper location, calibration and sequence of operation.
- B. Check operation of all controllers and controlled devices to verify proper action and direction.

Check the operation of all interlocks.

3.3 Air Balancing

- A. Leakage tests on ductwork must have been completed before air balancing.
- B. Set dampers, volume controls and fan speeds to obtain specified air delivery with minimum noise level. Rebalance as required to accomplish this. Simulate fully loaded filters during test.
- C. Set grille deflections as noted on plans. Modify deflections if required to eliminate drafts or objectionable air movement.
- D. Record air terminal velocity after completion of balance work.
- E. Record final grille and register deflection settings if different from that specified on contract drawings.
- F. Record all fan speeds.

3.4 Data Collection:

- A. In addition to the data required for any specified performance tests, measure and record the temperatures, pressures, flow rates, and nameplate data for all components listed herein.
- B. It is the intent of this section to record data on balanced systems, under normal operating or design conditions.
- C. Temperatures:
 - 1. Outside dry and wet bulb temperatures.
 - 2. Dry bulb temperature in each room and at least one wet bulb temperature in each zone.
 - 3. Refrigerant liquid and suction temperatures.
 - 4. Inlet and outlet temperature of each heat exchange device - both fluids.
- D. Pressures:
 - 1. Suction and discharge static pressure of each fan.
 - 2. Each refrigerant suction and discharge pressure.
- E. Flow rates:
 - 1. Flow rate through each fan.
- F. Nameplate Data:

1. Complete nameplate data for all equipment.
2. Motor data to include horsepower, phase, voltage, RPM, full load nameplate current, fuse rating in disconnect switch, number or manufacturer's size designation, and ampere rating of overcurrent and low voltage protection devices in starters.

END OF SECTION 230593

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 230713 – EXTERIOR INSULATION FOR DUCTWORK

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-23 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Approval Submittals:
 - 1.3.1 Product Data: Submit producer's data sheets and installation instructions on each insulation system including insulation, coverings, adhesives, sealers, protective finishes, and other material recommended by the manufacturer for applications indicated. Submit for:

Flexible duct insulation

- 1.4 O&M Data Submittals: Submit a copy of all approval submittals. Include in O&M Manual.

2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide insulation products by Knauf, Owens-Corning, Johns Manville, Certainteed.
- 2.2 Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, coverings, sealers, mastic, and adhesive) with a flame spread rating of 25 or less, and a smoke-developed rating of 50 or less as tested by ANSI/ASTM 84.
- 2.3 Flexible Fiberglass Insulation: ASTM C553, Type I, Class B-3 (temperature less than 350°F). Duct wrap shall be 1 pcf density with UL rated aluminum foil vapor barrier (FSK).
- 2.4 General Purpose Mastic: Benjamin Foster 35-00 Series, Insulcoustic VIAC Mastic, Childers CP-10, or approved equal. The final selection of this product for the specific application indicated is the responsibility of the insulation supplier. The insulation system must meet the specified application.
- 2.5 Vapor Barrier Sealant: Benjamin Foster 30-35, Insulcoustic IC-501, 3M EC-1378, Childers CP-30, or approved equal. Provide "Low Odor" type. The final selection of this product for the specific application indicated is the responsibility of the insulation supplier. The insulation system must meet the specified application.
- 2.6 Adhesive: Benjamin Foster 85-20, Insulcoustic IC-205, 3M EC-35, Childers CP-82, Childers CP-89, or approved equal. The final selection of this product for the specific application indicated is the responsibility of the insulation supplier. The insulation system must meet the specified application.
- 2.7 Fiber-Glas Mesh: 10x10 Mesh. Foster Mastafab or equal.

3 EXECUTION

- 3.1 Insulate all supply, return and outdoor air ductwork concealed above ceilings, in chases, or elsewhere, and the backs of all ceiling supply outlets with 2" thick fiberglass blanket insulation with vapor barrier.
- 3.2 Installation of Flexible Insulation:
 - 3.2.1 Insulate round elbows and fittings with wrap such that thickness is equal to adjoining duct covering. Clean and dry ductwork prior to insulating.
 - 3.2.2 Adhere insulation to duct with 50 percent coverage using approved insulation adhesive applied in 6-inch wide swaths with 6-inch spaces between swaths. Additionally secure insulation with perforated pins and Tuff-Bond or by self-sticking pins with a 3/8" self-tapping screw. Space on 12-inch centers and 3 inches from all edges. Ducts up through 24" wide only require one row of pins. Ducts over 24" wide shall have pins spaced as described herein.
 - 3.2.3 Lap all joints 2 inches and seal joints with 4-inch wide strips of open mesh glass fabric embedded in two coats of general purpose mastic.
 - 3.2.4 Seal all punctures and breaks in aluminum vapor barrier with open mesh glass fabric and vapor barrier sealant.

END OF SECTION 230713

SECTION 230716 – INSULATION FOR HVAC EQUIPMENT AND PIPING

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.
- 1.3 Approval Submittals:
 - 1.3.1 Product Data: Submit producer's data sheets and installation instructions on each insulation system including insulation, coverings, adhesives, sealers, protective finishes, and other material recommended by the manufacturer for applications indicated. Submit for:

Flexible unicellular piping insulation

- 1.4 O&M Data Submittals: Submit a copy of all approval submittals. Include in O&M Manual.

2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide insulation products by Armstrong, Johns Manville, Knauf, Owens Corning, Pittsburgh Corning, U.S. Rubber, or approved equal. All products shall be asbestos-free.
- 2.2 Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics, and adhesive) with a flame-spread rating of 25 or less, and a smoke-developed rating of 50 or less, as tested by ANSI/ASTM E84.
- 2.3 Pipe Insulation Materials:
 - 2.3.1 Flexible Unicellular Pipe Insulation: ASTM C534, Type I. (Tubular, suitable for use to 200°F.)
 - 2.3.2 Staples, Bands, Wires, and Cement: As recommended by the insulation manufacturer for applications indicated.
 - 2.3.3 Adhesives, Sealers, Protective Finishes: Products recommended by the insulation manufacturer for the application indicated.

3 EXECUTION

- 3.1 General:
 - 3.1.1 Install thermal insulation products in accordance with manufacturer's written instructions, and in compliance with recognized industry practices to ensure that insulation serves intended purpose.
 - 3.1.2 Install insulation materials with smooth and even surfaces and on clean and dry surfaces. Redo poorly fitted joints. Do not use mastic or joint sealer as filler for gapping joints and excessive voids resulting from poor workmanship.

- 3.1.3 Maintain integrity of vapor-barrier on insulation and protect it to prevent puncture and other damage. Label all insulation "ASBESTOS FREE".
- 3.1.4 Do not apply insulation to surfaces while they are hot or wet.
- 3.1.5 Do not install insulation until systems have been checked and found free of leaks. Surfaces shall be clean and dry before attempting to apply insulation. A professional insulator with adequate experience and ability shall install insulation.
- 3.1.6 Do not install insulation on pipe systems until acceptance tests have been completed except for flexible unicellular insulation. Do not install insulation until the building is "dried-in".
- 3.2 Flexible Unicellular Pipe Insulation:
 - 3.2.1 Insulate the following piping systems:
 - 3.2.1.1 Condensate drains from air conditioning units - ½" thick.
 - 3.2.1.2 Refrigerant piping - ¾" thick.
 - 3.2.2 Apply insulation in accordance with the manufacturer's recommendations and instructions. Mitre cut insulation to fit pipe fittings. Use approved cement to seal all joints and ends in the insulation.
 - 3.2.3 Insulation outside the building shall be protected by a smooth 0.016" thickness aluminum jacket secured with aluminum bands on 12" centers.

END OF SECTION 230716

HVAC 233113 – HVAC METAL DUCTWORK

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
 - 1.2 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.
 - 1.3 Extent of HVAC metal ductwork is indicated on drawings and in schedules, and by requirements of this section.
 - 1.4 Refer to other Division-23 sections for exterior insulation of metal ductwork.
 - 1.5 Refer to other Division-23 sections for ductwork accessories.
 - 1.6 Codes and Standards:
 - 1.6.1 SMACNA Standards: Comply with SMACNA's "HVAC Duct Construction Standards, Metal and Flexible" 1985 Edition for fabrication and installation of metal ductwork, unless otherwise noted.
 - 1.6.2 NFPA 90A Compliance: Comply with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".
 - 1.7 Approval Submittals:
 - 1.7.1 Product Data: Submit manufacturer's technical product data and installation instructions for the following.
 - Factory-fabricated ductwork
 - Sealants
 - Flexible duct
 - Spin-in fittings
 - Side take-off fittings
 - 1.7.2 Shop Drawings: Submit scaled layout drawings of HVAC metal ductwork and fittings including, but not limited to, duct sizes, locations, elevations, and slopes of horizontal runs, wall and floor penetrations, and connections. Show interface and spatial relationship between ductwork and proximate equipment. Show modifications of indicated requirements, made to conform to local shop practice, and how those modifications ensure that free area, materials, and rigidity are not reduced.
- ### 2 PRODUCTS
- 2.1 Ductwork Materials:
 - 2.1.1 Exposed Ductwork Materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains and discolorations, and other imperfections, including those which would impair painting.

- 2.1.2 Galvanized Sheet Metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ASTM A 527, lockforming quality; with G 90 zinc coating in accordance with ASTM A 525; and mill phosphatized for exposed locations. Stamp gauge and manufacturer's identification on each sheet. Break sheets so that identification is exposed.
- 2.2 Miscellaneous Ductwork Materials:
- 2.2.1 General: Provide miscellaneous materials and products of types and sizes indicated and, where not otherwise indicated, provide type and size required to comply with ductwork system requirements including proper connection of ductwork and equipment.
- 2.2.2 Duct Sealant: Provide non-hardening, non-migrating mastic or liquid elastic sealant, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork.
- 2.2.3 Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork. For exposed stainless steel ductwork, provide matching stainless steel support materials.
- 2.2.4 Flexible Ducts: Provide flexible ductwork with an R-value of R-6. The use of flexible ductwork for connection of supply air and return air devices is acceptable only where shown on the drawings.
- 2.2.4.1 Construction: Provide reinforced metalized polyester jacket that is tear and puncture resistant, air tight inner core with no fiberglass erosion in the air stream and an encapsulated wire helix. Flexible ductwork shall have a recommended operating pressure of 6" w.g. for sizes 4" through 12" diameter and 4" w.g. for sizes 14" through 20" diameter. All diameters shall be suitable for a negative operating pressure of 0.75" w.g. Flexible ductwork shall meet the requirements of UL-181, the Florida Energy Code, Florida Building Code, NFPA 90A and NFPA 90B.
- 2.2.4.2 Acceptable Manufacturers: Subject to compliance with requirements, provide R-6 flexible ductwork by: Atco 36, Flexmaster 8M-R6 or Thermaflex M-KE R6.
- 2.2.5 Spin-in and Side Take-off Fittings: Provide round branch run-outs as follows.
- 2.2.5.1 Spin in air device connections shall be straight sided spin in with damper and two inch high insulation stand-off equal to Crown 3720-DS.
- 2.2.5.2 Where duct height does not permit the use of spin-in fittings, use low profile side take-off fittings equal to Crown 3300-DS or Flexmaster STOD-BO.
- 2.2.6 Fittings: Provide radius type fittings fabricated of multiple sections with maximum 15° change of direction per section. Unless specifically detailed otherwise, use 45° laterals and 45° elbows for branch takeoff connections. Where 90° branches are indicated, provide conical type tees.
- 2.3 Fabrication:
- 2.3.1 Shop fabricate ductwork in 4, 8, 10 or 12-ft lengths, unless otherwise indicated or required to complete runs. Preassemble work in shop to greatest extent possible, so as to minimize field

assembly of systems. Disassemble systems only to extent necessary for shipping and handling. Match-mark sections for reassembly and coordinated installation.

- 2.3.2 Shop fabricate ductwork of gauges and reinforcement complying with SMACNA "HVAC Duct Construction Standards", except provide sealant at all joints. Supply duct between AHU discharge and terminal units shall be minimum 4" pressure class. Duct downstream of terminal units, supply duct from low pressure air conditioning units, and all return and exhaust duct shall be minimum 2" pressure class unless otherwise noted.
- 2.3.3 Fabricate duct fittings to match adjoining ducts, and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with center-line radius equal to 1½ times associated duct width; and fabricate to include turning vanes in elbows where shorter radius is necessary. Limit angular tapers to 30° for contracting tapers and 20° for expanding tapers.
- 2.3.4 Fabricate ductwork with accessories installed during fabrication to the greatest extent possible. Refer to Division-23 section "Ductwork Accessories" for accessory requirements.
- 2.4 Factory-Fabricated Low Pressure Ductwork (Maximum 2" W.G.):
 - 2.4.1 Material: Galvanized sheet steel complying with ASTM A 527, lockforming quality, with ASTM A 525, G90 zinc coating, mill phosphatized.
 - 2.4.2 Gauge: 28-gauge minimum for round ducts and fittings, 4" through 8" diameter. 26-gauge minimum 9" through 14", 24-gauge minimum 15" through 26".
 - 2.4.3 Elbows: One piece construction for 90° and 45° elbows 14" and smaller. Provide multiple gore construction for larger diameters with standing seam circumferential joint.
 - 2.4.4 Divided Flow Fittings: 90° tees, constructed with saddle tap spot welded and bonded to duct fitting body.
 - 2.4.5 Acceptable Manufacturers: Subject to compliance with requirements, provide factory-fabricated ductwork by Semco Mfg., Inc. or United Sheet Metal Div., United McGill Corp, or approved equal.

3 EXECUTION

- 3.1 General: Examine areas and conditions under which HVAC metal ductwork is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- 3.2 Installation of Metal Ductwork:
 - 3.2.1 General: Assemble and install ductwork in accordance with recognized industry practices which will achieve air-tight (5% leakage for systems rated 3" and under; 1% for systems rated over 3") and noiseless (no objectionable noise) systems, capable of performing each indicated service. Install each run with minimum number of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and to prevent buckling.

Support vertical ducts at every floor.

- 3.2.2 Supports: Install concrete inserts for support of ductwork in coordination with formwork, as required to avoid delays in work. Install self-drilling screw anchors in prestressed concrete or existing work.
- 3.2.3 Field Fabrication: Complete fabrication of work at project as necessary to match shop-fabricated work and accommodate installation requirements. Seal joints in round or oval ductwork with hard cast or shrink bands, and sheet metal screws, or by welding. High velocity rectangular ducts shall have approved joints and be made airtight with sealer or welding.
- 3.2.4 Routing: Locate ductwork runs, except as otherwise indicated, vertically and horizontally. Avoid diagonal runs wherever possible. Locate runs as indicated by diagrams, details and notations or, if not otherwise indicated, run ductwork in shortest route which does not obstruct useable space or block access for servicing building and its equipment. Hold ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building. Limit clearance to ½" where furring is shown for enclosure or concealment of ducts, but allow for insulation thickness, if any. Where possible, locate insulated ductwork for 1" clearance outside of insulation. In finished and occupied spaces, conceal ductwork from view by locating in mechanical shafts, hollow wall construction or above suspended ceilings, unless specifically noted as "Exposed". Do not encase horizontal runs in solid partitions, except as specifically shown. Coordinate layout with suspended ceiling and lighting layouts and similar finished work.
- 3.2.5 Electrical Equipment Spaces: Do not route ductwork through transformer vaults or other electrical equipment spaces and enclosures.
- 3.2.6 Penetrations: Where ducts pass through interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gauge as duct. Overlap opening on 4 sides by at least 1½". Fasten to duct and substrate. Where ducts pass through fire-rated floors, walls, or partitions, provide firestopping between duct and substrate.
- 3.2.7 Coordination: Coordinate duct installations with installation of accessories, dampers, coil frames, equipment, controls and other associated work of ductwork system.
- 3.2.8 Installation: Install metal ductwork in accordance with SMACNA HVAC Duct Construction Standards. Fan discharge outlet ducts shall be installed correctly with regard to "system effect" per AMCA Publication 201.
- 3.3 Installation of Flexible Ducts:
- 3.3.1 Maximum Length: For any duct run using flexible ductwork, do not exceed 5'-0" extended length. Flexible duct shall only be allowed as detailed on the drawings.
- 3.3.2 Installation: Install in accordance with Section III of SMACNA's "HVAC Duct Construction Standards, Metal and Flexible". Support flexible ducts to eliminate pinching and kinking which would restrict flow.
- 3.3.3 Peel back insulation and slide the inner core over the spin-in or diffuser neck, seal with duct sealant and install Panduit strap tightly. Slide insulation back over the inner core and install another Panduit strap over the insulation outer jacket. Tape is not acceptable.

- 3.3.4 Seal all exposed edges of fiberglass insulation with glassfab and mastic.
- 3.4 Leakage Tests: After each duct system is completed, test for duct leakage in accordance with Sections 3 and 5 of the SMACNA HVAC Air Duct Leakage Test Manual. Test pressure shall be equal to pressure class of duct, less 0.5" static pressure. Repair leaks and repeat tests until total leakage is less than 5% of system design air flow for low pressure systems and less than 1% for systems rated over 3".
- 3.5 Equipment Connections: Connect metal ductwork to equipment as indicated, provide flexible connection for each ductwork connection to equipment mounted on vibration isolators, and/or equipment containing rotating machinery. Provide access doors as indicated.
- 3.6 Clean ductwork internally free of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration. Keep ducts closed with poly during construction to prevent contamination by construction dust and debris.
- 3.7 Balancing: Refer to Division-23 section "Testing, Adjusting, and Balancing" for air distribution balancing of metal ductwork; not work of this section. Seal any leaks in ductwork that become apparent in balancing process.
- 3.8 System Adjustment: Adjust the system to provide functional operation to the extent possible, and leave ready for Testing and Balancing work. It is not the intent of this section to provide final testing and balancing, but to leave the system operational with a minimum of noise.

END OF SECTION 233113

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 233300 – DUCTWORK ACCESSORIES

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-23 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of ductwork accessories work is indicated on drawings and in schedules, and by requirements of this section.
- 1.4 Refer to other Division-23 sections for testing, adjusting, and balancing of ductwork accessories; not work of this section.
- 1.5 Codes and Standards:
 - 1.5.1 SMACNA Compliance: Comply with applicable portions of both SMACNA "HVAC Duct Construction Standards, Metal and Flexible"
 - 1.5.2 NFPA Compliance: Comply with applicable provisions of NFPA 90A "Air Conditioning and Ventilating Systems" pertaining to installation of ductwork accessories.
- 1.6 Approval Submittals:
 - 1.6.1 Product Data: Submit manufacturer's technical product data for each type of ductwork accessory, including dimensions, capacities, and materials of construction; and installation instructions as follows:
 - Low pressure manual dampers
 - Control dampers
 - Fire Dampers
 - Duct access doors
 - Flexible connections
 - 1.6.2 O&M Data Submittals: Submit manufacturer's maintenance data including parts lists for fire dampers, smoke dampers. Include this data, product data, and a copy of approval submittals in O&M manual.

2 PRODUCTS

2.1 Dampers:

- 2.1.1 Low Pressure Manual Dampers: Provide 16 gauge dampers of single-blade type (12" maximum blade width) or multiblade type. Damper blades to be gang-operated from a single shaft with nylon or ball bearings on each end. Provide indexed locking quadrant. Parallel or opposed blade style is acceptable. Provide 2" standoff on locking quadrant for externally insulated duct.

- 2.1.2 Control Dampers: Extruded aluminum (6063-T5) damper frame shall not be less than 0.080" in thickness. Damper frame shall be 4" deep x 1", with duct mounting flanges on both sides of frame. Damper frame shall have a 2" mounting flange on the rear of the damper when installed as Extended Rear Flange install type. Aluminum frame shall be clear anodized to a minimum thickness of 0.7 mil deep. Frame shall be assembled using stainless steel screws. Welded frames shall not be acceptable. Actuators (motors) are provided by mechanical contractor.
- 2.1.2.1 Blades shall be maximum 6.4" deep extruded aluminum (6063-T5) air-foil profiles with a minimum wall thickness of 0.06", clear anodized to a minimum thickness of 0.7 mil deep.
- 2.1.2.2 Blade seals shall be extruded silicone, secured in an integral slot within the aluminum blade extrusions and shall be mechanically fastened to prevent shrinkage and movement over the life of the damper. Adhesive or clip-on type blade seals will not be approved.
- 2.1.2.3 Hexagonal control shaft shall be $\frac{7}{16}$ ". It shall have an adjustable length and shall be an integral part of the blade axle. A field-applied control shaft shall not be acceptable. All parts shall be stainless steel.
- 2.1.2.4 Linkage hardware shall be aluminum and stainless steel, installed in the frame side, out of the airstream, and accessible after installation. Linkage hardware shall be complete with stainless steel cup-point trunnion screws to prevent linkage slippage. Linkage that consists of metal rubbing metal will not be approved.
- 2.1.2.5 Dampers shall be designed for operation in temperatures ranging from -40°F to 212°F.
- 2.1.2.6 Dampers shall be AMCA rated for Leakage Class 1A at 1 in w.g. static pressure differential. Standard air leakage data to be certified under the AMCA Certified Ratings Program.
- 2.1.2.7 Dampers shall be custom made to required size, with blade stops not exceeding 1¼" in height.
- 2.1.2.8 Dampers shall be opposed blade for modulating dampers or parallel blade action for open/shut dampers.
- 2.1.2.9 Dampers shall be installed in the following manner: Installed in Duct
- 2.1.2.10 Installation of dampers must be in accordance with manufacturer's current installation guidelines, provided with each damper shipment.
- 2.1.2.11 Field supplied intermediate structural support is required to resist applied pressure loads for dampers that consist of two or more sections in both height and width.
- 2.1.2.12 Acceptable Manufacturers: Subject to compliance with requirements, provide control dampers by TAMCO (T.A. Morrison & Co, Inc), Ruskin TED50CD, Greenheck VCD33, or approved equal.
- 2.1.3 Acceptable Manufacturers: Subject to compliance with requirements, provide dampers by Air Balance, American Warming & Ventilating, Arrow Louver and Damper, Penn Ventilator Co., or Ruskin Mfg. Co.
- 2.2 Fire Dampers:
- 2.2.1 Fire Dampers: Provide curtain type fire dampers, UL classified and labeled per UL 555, of types and

sizes indicated. Construct casings and blades of galvanized steel. Damper shall not restrict duct free area when open. Dampers shall be rated for dynamic closure under flow and pressure. Provide sleeves and mounting angles. Provide fusible link rated at 160 to 165° F unless otherwise indicated. Provide damper with positive lock in closed position. All dampers shall be spring activated. Basis of design:

1-1/2 HR: Ruskin IBD2 - Style B for rectangular, Style CR for round, Style CO for oval.

1-1/2 HR: Ruskin IBDT for transfer grilles in narrow partitions.

3 HR: Ruskin IBD23 - Style B for rectangular, Style CR for round, Style CO for oval.

2.2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide fire dampers by Air Balance, Inc., American Warning & Ventilating, Arrow Louver and Damper, Penn Ventilator Co., or Ruskin Mfg. Co.

2.3 Turning Vanes: Provide manufactured or fabricated single wall turning vanes and vane runners, constructed in accordance with SMACNA "HVAC Duct Construction Standards".

2.4 Duct Access Doors:

2.4.1 General: Provide duct access doors of size indicated, or as required for duty indicated.

2.4.2 Construction: Construct of same or greater gauge as ductwork served. Provide insulated doors for insulated ductwork. Provide flush frames for uninsulated ductwork, extended frames for externally insulated duct. Provide one side hinged, other side with one handle-type latch for doors 12" high and smaller, 2 handle-type latches for larger doors. Duct access doors for fire dampers shall be a minimum 12"x12".

2.4.3 Acceptable Manufacturers: Subject to compliance with requirements, provide access doors by Air Balance, Inc., Duro Dyne Corp., Greenheck, Ruskin Mfg. Co., or Ventfabrics, Inc.

2.5 Flexible Connections:

2.5.1 General: Provide flexible duct connections wherever ductwork connects to vibration isolated equipment. Construct flexible connections of neoprene-coated flameproof fabric crimped into duct flanges for attachment to duct and equipment. Make airtight joint. Provide adequate joint flexibility to allow for thermal, axial, transverse, and torsional movement, and also capable of absorbing vibrations of connected equipment.

2.5.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following: Duro Dyne Corp., Flexaust (The) Co., or Ventfabrics, Inc.

3 EXECUTION

3.1 Examine areas and conditions under which ductwork accessories will be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 Installation of Ductwork Accessories:

- 3.2.1 Install ductwork accessories in accordance with manufacturer's installation instructions, with applicable portions of details of construction as shown in SMACNA standards, and in accordance with recognized industry practices to ensure that products serve intended function.
- 3.2.2 Install balancing dampers at all main ducts adjacent to units in return air, outside air and where indicated.
- 3.2.3 Install control dampers in the outside air duct and for each air handler.
- 3.2.4 Install turning vanes in square or rectangular 90° elbows in supply, return, and exhaust air systems, and elsewhere as indicated.
- 3.2.5 Install access doors to open against system air pressure, with latches operable from either side, except outside only where duct is too small for person to enter. Install on entering air side of reheat coils. Install at motorized dampers and smoke detectors.
- 3.2.6 Install flexible connections in ductwork such that the clear length of the connector is approximately two inches. Provide thrust restraints as required. Flexible material shall not be so slack as to take a definite concave or convex shape during fan operation.
- 3.2.7 Coordinate with other work, including ductwork, as necessary to interface installation of ductwork accessories properly with other work.
- 3.2.8 Install fire dampers within fire walls and floors at locations shown on the mechanical drawings. Install in strict accordance with the manufacturer's printed instructions, NFPA 90A, and UL 555. Basis of design installation is detailed on the drawings.
- 3.3 Fire Dampers: Notify Engineer at least 24 hours in advance of ceiling installation or chase closure so that complete fire damper installation can be observed. A copy of the manufacturer's printed installation instructions shall be available at the site.
- 3.4 Operate installed ductwork accessories to demonstrate compliance with requirements. Test for air leakage while system is operating. Repair or replace faulty accessories as required to obtain proper operation and leakproof performance.
- 3.5 Adjusting and Cleaning:
 - 3.5.1 Adjusting: Adjust ductwork accessories for proper settings.
 - 3.5.2 Final positioning of manual dampers is specified in Division-23 section "Testing, Adjusting, and Balancing". However, the system shall be left functional with all dampers open or throttled.
 - 3.5.3 Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.
 - 3.5.4 Furnish extra fusible links to Owner, one link for every 10 installed of each temperature range; obtain receipt.

END OF SECTION 233300

SECTION 233400 – FANS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-23 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of fan work required by this section as indicated on drawings and schedules, and by requirements of this section.
- 1.4 Coordination:
 - 1.4.1 Refer to Division-7 sections for installation of prefabricated roof curbs; not work of this section. Furnishing prefabricated roof curbs is part of this section's work.
 - 1.4.2 Refer to Division-23 section "Testing, Adjusting, and Balancing" for balancing of fans.
 - 1.4.3 Refer to Division-23 HVAC control systems sections for control work required in conjunction with fans.
 - 1.4.4 Refer to Division-26 sections for power supply wiring from power source to power connection on fans. Division-26 work will include starters, disconnects, and required electrical devices, except where specified as furnished, or factory-installed, by manufacturer.
- 1.5 Codes and Standards:
 - 1.5.1 AMCA Compliance: Provide fans which have been tested and rated in accordance with AMCA standards, and bear AMCA Certified Ratings Seal.
 - 1.5.2 UL Compliance: Provide fans which are listed by UL and have UL label affixed.
- 1.6 Approval Submittals:
 - 1.6.1 Product Data: Submit manufacturer's technical data for fans, including specifications, capacity ratings, dimensions, weights, materials, accessories furnished, and installation instructions. Submit assembly-type drawings showing unit dimensions, construction details, methods of assembly of components, and field connection details.

Fans
Vibration Control
- 1.7 O&M Data Submittals: Submit maintenance data and parts list for each type of fan, accessory, and control. Include these data, a copy of approved submittals, and wiring diagrams in O&M Manual.

2 PRODUCTS

- 2.1 General: Except as otherwise indicated, provide standard prefabricated fans of type and size indicated, modified as necessary to comply with requirements, and as required for complete

installation. Provide accessories as listed in the schedule on the drawings and as described herein. Motors shall be high efficiency per Division-23 section "Motors".

- 2.2 Acceptable Manufacturers: Subject to compliance with requirements provide fans manufactured by Acme, Greenheck, Loren Cook, Penn or approved equal unless otherwise noted herein.
- 2.3 Centrifugal Ceiling Exhausters:
- 2.3.1 Fan Assembly: Provide steel housing, plastic or aluminum grille, backdraft damper, statically and dynamically balanced fan wheel, permanently lubricated motor with internal thermal overloads, vibration isolation and all required mounting hardware and brackets. Provide acoustically treated housing for all fans larger than 60 cfm. Mounting type shall be as indicated on the drawings or on the schedule.
- 2.3.2 Connectors: Provide adaptors, connectors, and eave elbows as required to connect fan discharges to outlets.
- 2.3.3 Outlets: Provide where shown on the drawings (or required by the installation) wall caps, vent caps, or roof jacks, each with birdscreen, to match fans and surrounding construction.
- 2.4 Vibration Isolation: Mount fans on vibration isolators in accordance with the requirements of Division-23 section "Vibration Isolation" and the following list.

- 2.4.1 Hangers: Type HA2.

3 EXECUTION

- 3.1 General: Except as otherwise indicated or specified, install fans in accordance with manufacturer's installation instructions and recognized industry practices to insure that fans serve their intended function.
- 3.2 Coordinate fan work with work of walls, roofs, and ceilings as necessary for proper interfacing. Framing of openings, caulking, and curb installation is not work of this section.
- 3.3 Ductwork: Refer to Division-23 section "Ductwork". Connect ducts to fans in accordance with manufacturer's installation instructions. Provide flexible connections in ductwork at fans.
- 3.4 Install fans on vibration isolation equipment as required. Set level and plumb.
- 3.5 Electrical Wiring: Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to electrical Installer. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-26 sections. Verify proper rotation direction of fan wheels. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.
- 3.6 Remove shipping bolts and temporary supports within fans. Adjust dampers for free operation.
- 3.7 Testing: After installation of fans has been completed, test each fan to demonstrate proper operation of units at performance requirements specified. When possible, field correct malfunctioning units,

then retest to demonstrate compliance. Replace units which cannot be satisfactorily corrected.

- 3.8 Cleaning: Clean factory-finished surfaces. Remove all tar and soil. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

END OF SECTION 233400

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 233713 – GRILLES, REISTERES, AND CEILING DIFFUSERS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-23 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of air outlets and inlets work is indicated by drawings and schedules, and by requirements of this section.
- 1.4 Refer to other Division-23 sections for ductwork and duct accessories required in conjunction with air outlets and inlets and for balancing of air outlets and inlets; not work of this section.
- 1.5 Codes and Standards:
 - 1.5.1 ADC Compliance: Test and rate air outlets and inlets in certified laboratories under requirements of ADC 1062 "Certification, Rating and Test Manual". Provide air outlets and inlets bearing ADC Certified Rating Seal.
 - 1.5.2 NFPA Compliance: Install air outlets and inlets in accordance with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".
- 1.6 Approval Submittals:
 - 1.6.1 Product Data: Submit manufacturer's technical product data for air outlets and inlets indicating construction, finish, and mounting details.
 - 1.6.2 Performance Data: For each type of air outlet and inlet furnished, provide aspiration ability, temperature and velocity traverses, throw and drop, and noise criteria ratings. Indicate selections and data as required.
- 1.7 O&M Data Submittals: Submit cleaning instructions for finishes and spare parts lists. Include this data and a copy of approval submittals in O&M manual.

2 PRODUCTS

- 2.1 General:
 - 2.1.1 Except as otherwise indicated, provide manufacturer's standard grilles, registers, and ceiling diffusers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation.
 - 2.1.2 Manufacturers not listed in the following specification will not be considered for approval unless accepted by addendum prior to bid.
 - 2.1.3 Performance: Provide grilles, registers and ceiling diffusers that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each size device equal to the basis of design.

- 2.1.4 Ceiling and Wall Compatibility: Provide grilles, registers and diffusers with border styles that are compatible with adjacent wall and ceiling systems, and that are specifically manufactured to fit into ceiling module or wall with accurate fit and adequate support. Refer to general construction drawings and specifications for types of ceiling systems and walls which will contain each type of ceiling diffuser, grille, or register.
- 2.1.5 Appearance: All grilles and registers shall be aluminum construction and all diffusers shall be aluminum construction, unless otherwise noted, with uniform matching appearance for each type of outlet. Ceiling mounted grilles and registers shall be set to be sight tight from the predominant exposure.
- 2.1.6 Finish: All ceiling mounted grilles, registers, and diffusers shall be finished with manufacturer's standard color to be selected by the architect. Wall and door mounted grilles and registers shall be finished with clear anodized finish .
- 2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products by Titus, Price, Krueger, or Metal Aire.
- 2.3 Rectangular Ceiling Diffusers: Provide rectangular face, adjustable diffuser with removable inner core, no corner joints. If square or rectangular neck is provided, provide square to round adaptor as required. Provide lay-in panel as required. Provide beveled trim ring for diffusers in hard ceilings.
- 2.4 Square Ceiling Diffusers: Provide square face, adjustable, 360 degree pattern diffusers with one-piece stamped cones, no corner joints, round necks. Provide lay-in panel as required.
- 2.5 Return Grilles : Provide return grilles with one set of 45 degree fixed louvers, parallel to the long dimension. Provide mounting frame for all wall and plaster ceiling installations.

3 EXECUTION

- 3.1 Coordinate installation with ceiling and light fixture installation. Locate ceiling outlets as indicated on architectural Reflected Ceiling Plans. Unless otherwise indicated, locate ceiling outlets in the center of acoustical ceiling modules with sides parallel to the grid.
- 3.2 Install air outlets and inlets in accordance with manufacturer's written instructions and in accordance with recognized industry practices to insure that products serve intended functions.
- 3.3 Coordinate with other work, including ductwork and duct accessories, as necessary to interface installation of air outlets and inlets with other work.
- 3.4 Set air volumes to values shown on the drawings so that the system is functional. Leave ready for test and balance contractor.
- 3.5 Furnish to Owner three operating keys for each type of outlet and inlet that require them; obtain receipt.

END OF SECTION 23371

SECTION 233726 – WALL LOUVERS

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-23 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of wall louver work is indicated by drawings and schedules, and by the requirements of this section.
- 1.4 Refer to other Division-23 sections for ductwork, duct accessories and controls work.
- 1.5 AMCA Compliance: Test and rate louvers in accordance with AMCA Standard 500. Provide AMCA certified rating seal. Ratings based on tests and procedures performed in accordance with AMCA 500-L and complying with the AMCA 511 Certified Ratings Program. AMCA Certified Ratings Seal applies to air performance, water penetration and wind driven rain ratings.
- 1.6 Product Qualifications:
 - 1.6.1 Florida Product Approved Louvers:
 - 1. Miami-Dade County, Florida Notice of Acceptance (NOA).
 - 2. Florida Building Code Approval.
 - 3. Louver shall be certified to Florida Building Code Testing Application Standards TAS 100(A) (Wind Driven Rain Resistance), TAS 201 (Large Missile Impact), TAS 202 (Uniform Static Air Pressure) and TAS 203 (Cyclic Wind Loading).
 - 4. AMCA Listed for compliance to AMCA 540 Level E and AMCA 550 standards.
- 1.7 Approval Submittals:
 - 1.7.1 Product data: Submit manufacturer's technical product data for louvers including: model number, accessories furnished, construction, finish, mounting details, performance data.
- 1.8 O&M Data Submittals: Submit maintenance data, including cleaning of finishes and a copy of approval submittals. Include in O&M manual.

2 PRODUCTS

- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, submit products by Ruskin, Greenheck, Arrow, American Warming and Ventilating, or AMCA labeled approved equal.
- 2.2 General: Except as otherwise indicated, provide manufacturer's standard louvers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation. Provide Kynar 500 coated, corrosion resistant finish and 5 year warranty; color to be selected by the Owner.
- 2.3 Substrate Compatibility: Provide Florida Product approved louvers with 9 inch frame with flange and sill extension piece that are compatible with adjacent substrate, and that are specifically manufactured

to fit into construction openings with accurate fit and adequate support, for weatherproof installation. Refer to general construction drawings and specifications for types of substrate which will contain each type of louver.

2.4 Materials:

2.4.1 Florida Product Approved Louvers: Construct of aluminum extrusions, Alloy 6063-T6 0.081" thick for frame and 0.081" thick for front blades and 0.060" thick for back blades. Weld units or use stainless steel fasteners.

2.5 Sill Flashing: Formed aluminum, 0.080" thick, upturned sides to prevent water leakage.

2.6 Installation Angles: Material: 1.375 x 2.25 inch x 0.125 inch thick continuous aluminum angles around louver perimeter for installation in concrete, deep CMU, steel and wood substrate wall systems.

2.7 Installation Plates: Material: 0.250 inch (6.4 mm) thick continuous aluminum flat or zee plates for installation in thin CMU substrate wall systems.

2.8 Louver Screens: On inside face of exterior louvers, provide 1/2" square mesh anodized aluminum wire bird screens mounted in removable extruded aluminum frames.

2.9 Stationary Florida Product Approved Louvers: Hurricane and impact rated louvers, basis of design is Greenheck EHV-901D.

2.10 Performance Data

2.10.1 EHV-901D:

1. Performance Ratings: AMCA licensed.
 - a. Based on testing 48 inches x 48 inches size unit in accordance with AMCA 500-L.
2. Free Area: 42 percent, nominal.
3. Free Area Size: 6.66 square feet.
4. Maximum Recommended Air Flow through Free Area: 2,155 feet per minute.
5. Air Flow: 10,431 cubic feet per minute.
6. Maximum Pressure Drop (Intake): 0.60 inches w.g..
7. Water Penetration: Beginning point of water penetration of 0.01 ounce per ft² of free area shall be above 1,250 feet per minute free area velocity.
8. Wind Load Rating: Maximum wind load of ±150 PSF.
9. AMCA 500-L Wind Driven Rain Performance: 99.9 percent effective at preventing water penetration through louver when tested at 50 miles per hour wind with 8 inches per hour rainfall and 2,155 feet per minute airflow through the free area. Penetration Class 'A' with Discharge Class (Intake) '3' in accordance with AMCA 500-L Wind Driven Rain Test.

3 EXECUTION

3.1 Install where shown on the drawings in accordance with the manufacturer's printed instruction and Florida Product Approval. Exercise care to prevent scratches.

3.2 Isolate dissimilar metals per the manufacturer's recommendations.

- 3.3 Verify size of louvers shown on drawings prior to fabrication. Coordinate with wall openings. Sizes may be altered subject to approval by Engineer provided free area remains approximately the same as indicated.

END OF SECTION 233726

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 2343218 – BI POLAR IONIZATION SIR CLEANING EQUIPMENT

1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.2 Division-23 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.3 Extent of air cleaning work required by this section is indicated on drawings and schedules, and by requirements of this section.
- 1.4 Refer to Division-23 air handling units section for filter boxes associated with air handling units; not work of this section.
- 1.5 Refer to Division-23 duct accessories section for duct access door work required in conjunction with air filters; not work of this section.
- 1.6 Refer to Division-26 sections for power supply wiring from power source to power connection on air filter units. Include starters, disconnects, and required electrical devices, except where specified as furnished, or factory-installed by manufacturer.
- 1.7 Control wiring specified as work of Division 15 for Automatic Temperature Controls is work of that section.
- 1.8 Codes and Standards:
 - 1.8.1 NFPA Compliance: Comply with applicable portions of NFPA 90A pertaining to installation of air filters.
 - 1.8.2 UL Compliance: Comply with UL Standards pertaining to safety and performance of air filter units.
 - 1.8.3 ASHRAE Compliance: Comply with provisions of ASHRAE Standard 52 for method of testing, and for recording and calculating air flow rates.
- 1.9 Approval Submittals:
 - 1.9.1 Product Data: Submit manufacturer's technical product data including dimensions, weights, required clearances and access, flow capacity including initial and final pressure drop at rated air flow, efficiency and test method, fire classification, and installation instructions.

BiPolar Ionization
 - 1.9.2 Shop Drawings: Submit manufacturer's assembly-type shop drawings indicating dimensions, materials, and methods of assembly of components.

BiPolar Ionization
- 1.10 Test Reports and Verification Submittals:

1.10.1 Submit HEPA filter test reports.

1.11 O&M Data Submittals:

1.11.1 Maintenance Data: Submit maintenance data and spare parts lists for each type of filter and rack required. Include this data, product data and a copy of approval submittals in O&M manual.

1.11.2 Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to air filter units. Submit manufacturer's ladder-type wiring diagram for control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed. Include in O&M manual.

2 PRODUCTS

2.1 BIPOLAR IONIZATION SYSTEM

2.1.1 The Air Purification System shall be a product of an established manufacturer within the USA.

2.1.2 A qualified representative from the manufacturer shall be available to inspect the installation of the air purification system to ensure installation in accordance with manufacturer's recommendation.

2.1.3 Technologies that do not address gas disassociation such as UV Lights, Powered Particulate Filters and/or polarized media filters shall not be considered. Uni-polar ion generators shall not be acceptable. "Plasma" particulate filters shall not be acceptable.

2.1.4 Projects designed using ASHRAE Standard 62, IAQ Procedure shall require the manufacturer to provide Indoor Air Quality calculations using the formulas within ASHRAE Standard 62.1-2007 to validate acceptable indoor air quality at the quantity of outside air scheduled with the technology submitted. The manufacturer shall provide independent test data on a previous installation performed within the last two years and in a similar application, that proves compliance to ASHRAE 62 and the accuracy of the calculations.

2.1.5 The Air Purification System have been tested by UL or Intertek/ETL to prove conformance to UL 867-2007 including the ozone chamber testing and peak ozone test for electronic devices. Manufacturers that achieved UL 867 prior to December 21, 2007 and have not been tested in accordance with the newest UL 867 standard with the ozone amendment shall not be acceptable. All manufacturers shall submit their independent UL 867 test data with ozone results to the engineer during the submittal process. All manufacturers shall submit a copy with their quotation. Contractors shall not accept any proposal without the proper ozone testing documentation.

2.1.6 The maximum allowable ozone concentration per the UL 867-2007 chamber test shall be 0.007 PPM. The maximum peak ozone concentration per the UL 867-2007 peak test as measured 2 inches away from the electronic air cleaner's output shall be no more than 0.0042 PPM. Manufacturers with ozone output exceeding these ozone values shall not be acceptable.

2.1.7 Equipment shall be warranted by the manufacturer against defects in material and workmanship for a period of twelve months after shipment or eighteen months from owner acceptance, whichever occurs first. Labor to replace equipment under warranty shall be provided by the owner or installing contractor.

2.1.8 General

The air purification system(s) shall be of the size, type, arrangement and capacity indicated and required by the unit furnished and shall be of the manufacturer specified.

Basis of Design: Global Plasma Solutions

Approved equals by Airgenics, Active Air Solutions, and Plasma Air subject to specification compliance. All other Suppliers of comparable products requesting prior approval shall:

Submit for prior approval in accordance with the requirements of Mechanical General.

In addition, manufacturers submitting for prior approval for Bi-Polar Ionization must as part of the prior approval request provide their ASHRAE 62.1-2007 calculations that prove conformance to the ASHRAE Standard with the reduction of outside air to the scheduled values. A letter on the manufacturer's letterhead requesting prior approval must accompany the request for prior approval stating their calculations are ASHRAE compliant. A third party validation study performed on a previous installation of the same application shall also be included.

Submit independent test data from ETL or UL showing ozone levels produced during the UL 867 ozone chamber test. Manufacturers without this test data shall not be acceptable.

2.1.9 Bi-Polar Ionization Design & Performance Criteria: Each piece of air handling equipment, so designated on the plans, details, equipment schedules and/or specifications shall contain a Plasma Generator with Bi-polar Ionization output as described here within.

2.1.10 The Bi-polar Ionization system shall be capable of:

Effectively killing microorganisms downstream of the bi-polar ionization equipment (mold, bacteria, virus, etc.).

Controlling gas phase contaminants generated from human occupants, building structure and furnishings.

Capable of reducing static space charges.

Increasing the interior ion levels, both positive and negative, to a minimum of 800 ions/cm³ measured 5 feet from the floor.

2.1.11 The bi-polar ionization system shall operate in a manner such that equal amounts of positive and negative ions are produced. Uni-polar ion devices shall not be acceptable.

Air exchange rates may vary through the full operating range of a constant volume or VAV system. The quantity of air exchange shall not be increased due to requirements of the air purification system.

Velocity Profile: The air purification device shall not have maximum velocity profile.

2.1.12 Humidity: Plasma Generators shall not require preheat protection when the relative humidity of the entering air exceeds 85%. Relative humidity from 0 - 100%, condensing, shall not cause damage, deterioration or dangerous conditions within the air purification system. Air purification system shall be capable of wash down duty.

2.1.13 Equipment Requirements:

Electrode Specifications (Bi-polar Ionization):

Each Plasma Generator with Bi-polar Ionization output shall include the required number of electrodes and power generators sized to the air handling equipment capacity. A minimum of one electrode pair per 2400 CFM of air flow shall be provided. Bi-polar ionization tubes manufactured of glass and steel mesh shall not be acceptable due to replacement requirements, maintenance, performance output reduction over time, ozone production and corrosion.

Electrodes shall be energized when the main unit disconnect is turned on and the fan is operating. Internal circuitry shall be provided to sense air flow across the electrode output. Ionization systems requiring the use of a mechanical air pressure switch to cycle the electrodes only when the fan is operating shall not be acceptable due to high failure rates and pressure sensitivity.

- 2.1.14 Ionization Requirements: Plasma Generators with Bi-polar ionization output shall be capable of controlling gas phase contaminants and shall be provided for all equipment listed above. The Bi-polar ionization system shall consist of Bi-Polar Plasma Generator and power supply. The Bi-polar system shall be installed where indicated on the plans or specified to be installed. The device shall be capable of being powered by DC power or 24VAC or 110VAC to 240VAC without the use of an external transformer. Ionization systems requiring isolation transformers shall not be acceptable.

Ionization Output: The ionization output shall be controlled such that an equal number of positive and negative ions are produced. Imbalanced levels shall not be acceptable.

Ionization output from each electrode shall be a minimum of 15 million ions/cc when tested at 2" from the ionization generator.

All manufacturers shall provide documentation by an independent NELEC accredited laboratory that proves the product has minimum kill rates for the following pathogens given the allotted time and in a space condition:

MRSA - >96% in 30 minutes or less
E.coli - > 99% in 15 minutes or less
TB - > 69% in 60 minutes or less

Manufacturers not providing the equivalent space kill rates shall not be acceptable. All manufactures requesting prior approval shall provide to the engineer independent test data from a NELEC accredited independent lab confirming kill rates and time meeting the minimum requirements stated in section 2.2 B, points 6A, 6B and 6C. Products tested only on Petri dishes to prove kill rates shall not be acceptable.

- 2.1.15 Ozone Generation: The operation of the electrodes or Bi-polar ionization units shall conform to UL 867-2007 with respect to ozone generation. There shall be no ozone generation during any operating condition, with or without airflow.
- 2.1.16 Electrical Requirements: Wiring, conduit and junction boxes shall be installed within housing plenums in accordance with NEC NFPA 70. Plasma Generator shall accept an electrical service of 24 VAC or 100 VAC to 240VAC, 1 phase, 50/60 Hz.

2.1.17 The contractor shall coordinate electrical requirements with air purification manufacturer during submittals.

2.1.18 Control Requirements:

All Plasma Generators shall have internal short circuit protection, overload protection, and automatic fault reset.

Integral airflow sensing shall modulate the Plasma output as the air flow varies or stops.

A mechanical air flow switch shall not be acceptable as a means to activate the Plasma device due to high failure rates and possible pressure reversal.

The installing contractor shall mount and wire the Plasma device within the air handling unit specified or as shown on the plans. The contractor shall follow all manufacturer IOM instructions during installation.

3 EXECUTION

3.1 General: Comply with installation requirements as specified elsewhere in these specifications pertaining to air filters housing/casings, and associated supporting devices.

3.2 AIR PURIFICATION SYSTEM

3.2.1 General: The Contractor shall be responsible for maintaining all air systems until the owner accepts the building (Owner Acceptance).

3.2.2 Assembly & Erection: Plasma Generator with Bi-Polar Ionization

All equipment shall be assembled and installed in a workman like manner to the satisfaction of the owner, architect, and engineer.

Any material damaged by handling, water or moisture shall be replaced, by the mechanical contractor, at no cost to the owner.

All equipment shall be protected from dust and damage on a daily basis throughout construction.

3.2.3 Testing: Provide the manufacturers recommended electrical tests.

3.2.4 Commissioning & Training: A manufacturer's authorized representative shall provide start-up supervision and training of owner's personnel in the proper operation and maintenance of all equipment.

3.3 Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to electrical installer. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-26 sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.

END OF SECTION 234318

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 238126 – AIR SOURCE UNITARY SPLIT SYSTEM HEAT PUMP UNITS

PART 1 GENERAL

- 1.01 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- 1.02 Division-23 Basic Mechanical Materials and Methods sections apply to work of this section.
- 1.03 Refer to other Division-23 sections for testing, adjusting, and balancing of air conditioning units (AHUs).
- 1.04 Approval Submittals:
 - A. Product Data: Submit manufacturer's technical product data, including dimensions, ratings, electrical characteristics, weight, capacities, materials of construction, and installation instructions.
 - 1. Split system units
 - 2. Vibration Isolation
- 1.05 O&M Data Submittals: Submit manufacturer's maintenance data including parts lists. Include these data, a copy of approval submittals, product data, and wiring diagrams in O&M manual.

PART 2 PRODUCTS

- 2.01 Quality Assurance:
 - A. Provide units tested by UL, ARL or ETL.
 - B. Construct refrigeration system in accordance with ASHRAE 15 (ANSI B 9.1) "Safety Code for Mechanical Refrigeration".
 - C. Test and rate AHUs in accordance with the applicable ARI standards and provide certified rating seal. Sound test and rate units in accordance with ARI 270.
 - D. Provide units with an EER or SEER2 that meets the Florida Energy Efficiency Code and the schedules on the drawings.
 - E. Provide units with EPA approved refrigerant and factory installed refrigerant monitor.
 - F. Acceptable Manufacturers: Subject to compliance with requirements provide units by: Carrier, Trane, Lennox, York or approved equal.
- 2.02 General:
 - A. Units shall be factory-assembled, wired and tested. All controls shall be factory-adjusted and preset to the design conditions.
 - B. Casings: Construct of heavy gauge steel (or aluminum) formed panels rigidly reinforced and braced. Each unit shall be provided with removable panels to permit the unit (including fans and compressors) to be properly maintained and serviced. Entire casing shall be painted with factory-

applied finish. Casing for outdoor units shall be provided with weatherproof construction with all seams bolted. Provide stainless steel hardware.

- C. Supports: Provide individual concrete pad for each unit 4" larger than the unit on all sides.

2.03 Condensing Unit:

- A. Condenser Fans and Drives: Fan shall of rustproof construction: hot-dipped galvanized steel, stainless steel or aluminum. Unit shall have a variable speed motor suitable for the duty indicated. Provide a close fretwork galvanized steel or non-ferrous fan and guard. Motors shall be the permanently lubricated type, resiliently mounted.
- B. Condenser Coil: Construct of copper nonferrous tubes and nonferrous fins. Provide inlet guard to protect condenser fins.
- C. Compressor: Shall be hermetic scroll design for R454b refrigerant with vibration isolation. Each compressor shall have separate refrigerant circuit. Motors shall be ball bearing, high starting torque, low starting current type for compressor service. Compressors shall not produce objectionable noise or vibration inside the building. Compressors shall have five (5) year warranty. Provide dual compressor machines if scheduled.
- D. Service Valves: Provide for high and low pressure readings.

2.04 Evaporator Unit:

- A. Interior of unit shall be thermally and acoustically insulated with minimum R=4.2 insulation. . Provide removable panels to permit the unit to be properly serviced and maintained.
- B. The evaporator shall include centrifugal fan, fan motor, direct drive and lubricated bearings. Motors shall be high efficiency type. Provide cooling coils constructed of copper tubes and aluminum fins. Filters and coils shall be selected for a maximum face velocity of 500 fpm. Provide thermal expansion valve, sight glass, refrigerant drier, strainer, controls and other necessary devices for a completely automatic unit.
- C. Each unit shall be equipped with sloped IAQ drain pans under the entire evaporator coil to prevent condensate carry-over.

2.05 Electric Heater Section:

- A. Provide electric heating coils controlled by one or more magnetic contactors. Three phase coils shall be wired for balanced current in each wire, if possible. Furnish and install necessary overheating and air flow controls to meet the requirements of the National Electric Code. Provide built-in air flow switch and heater interlock relay.
- B. Heaters shall be factory mounted and wired with all required fuses and contactors to provide single point connection.

2.06 Unit Controls:

- A. All safety and operational controls shall be factory wired.

B. Safety and Operational Control Features:

Internal compressor overtemperature protection.
Crankcase heaters.
Individual motor overcurrent protection.
High pressure cutout.
Low pressure cutout.
Anti-recycle timer (5 minute)
Timer-type defrost control.
Liquid line solenoid.

2.07 Refrigerant Piping:

- A. Copper tubing 3/4" and smaller: Type ACR, hard-drawn temper tubing; wrought-copper, solder-joint fitting; brazed joints.
- B. Copper tubing 7/8" – 4-1/8": Type ACR, hard-drawn temper tubing; wrought-copper, solder-joint fitting; brazed joints.
- C. Silver solder material: Silver solder bearing at least 15% silver; Sil Fos.

2.08 Basic Vibration Isolation: Provide vibration isolation products complying with Division-23 section "Vibration Isolation" and the following list:

- A. Equipment Mounting (Indoor): Type EM5

PART 3 EXECUTION

- 3.01 Installation: Install in accordance with producer's printed instructions. Brush out fins on all coils.
- 3.02 Support: Mount units on concrete pads with manufacturer's recommended service and operating clearance.
- 3.03 Mount units on vibration isolation.
- 3.04 Brush out fins on all coils.
- 3.05 Refrigerant Piping: Comply with ANSI B31.5, "Refrigerant Piping," (except lower pressure limits below 15 psig), and ASHRAE 15 (ANSI B9.1). Make all joints carefully and neatly. Clean pipe and fittings before fluxing. Remove burrs. Braze by the sweat method using Sil Fos. Install field installed refrigerant devices and valves as required.
- 3.06 Testing: After job erection, or modification of factory installed piping, pressure test for leaks at 150 psig using a nominal amount of a suitable tracer refrigerant and dry nitrogen or a suitable refrigerant. Perform leak tests with an electronic halide leak detector having a sensitivity of at least ½ ounce R-12 per year. Refrigeration piping will not be accepted unless it is gas tight.
- 3.07 Evacuation: After completing the successful pressure test, multiple-evacuate the system. Leave the compressor isolation valves shut and connect the vacuum pump to both the high and low sides. Evacuate

the system to an absolute pressure of 1,500 microns. Then break vacuum to 2 psig with dry nitrogen. Repeat this process. Install the proper biflow drier in the liquid line and evacuate the system to 500 microns. Leave vacuum pump running for at least two hours without interruption. Break vacuum with the refrigerant to be used and raise pressure to 2 psig. Do not operate compressors during the evacuation procedure.

- 3.08 Charging: After completing the successful evacuation procedure, charge refrigerant directly to the system from the original containers through a filter drier. Charge to the manufacturer's stated conditions of pressure for required temperature. Weigh the refrigerant added and record on the startup report.
- 3.09 Construction Filters: Provide 1" thick filters in all units during construction. After construction (but prior to the test and balance being performed) install clean final filters.
- 3.10 Cleaning: Clean tar and all other soil from housing exterior. Leave ready for Division 7, Caulking Work. Caulk around pipe sleeves.
- 3.11 Condensate Drain: Pipe trapped copper condensate drain (full size of unit outlet) to nearest floor/roof drain or as shown on the drawings. Refer to Division-23 section "Insulation" for pipe insulation.
- 3.12 Startup: Check entire assembly for correctness of installation, alignment, and control sequencing. Start all component parts in proper sequence. Make all adjustments required to insure proper smooth quiet operation.

END OF SECTION 238126

PART 05 ELECTRICAL SPECIFICATIONS (WATFORD)

SECTION 260000 – ELECTRICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Electrical General Requirements specifically applicable to Division 26 Sections, in addition to Division 1-General Requirements.

1.2 PROJECT/SITE CONDITIONS:

- A. Install work in locations shown on Drawings, unless prevented by project conditions.
- B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other Sections. Obtain permission of Engineer before proceeding.
- C. Before submitting a proposal for the work contemplated in these specifications and accompanying Drawings, each bidder shall examine the site and familiarize himself with all the existing conditions and limitations. No additional compensation will be allowed because of the Contractor's misunderstandings as to the amount of work involved or his lack of knowledge of any condition in connection with the work.

1.3 REGULATORY REQUIREMENTS:

- A. Permits and Inspections: This Contractor shall secure and pay for all permits, and inspections required on work performed under this section of the Specifications. He shall assume full responsibility for all assessments and taxes necessary for the completion and acceptance of the work.
- B. Applicable Standards and Codes: All materials and workmanship shall comply with all applicable codes, specifications, local ordinances, industry standards and utility company regulations. In case of difference between building codes, specifications, federal and state laws, local ordinances, industry standards and utility company regulations and the Contract Documents, the most stringent requirements shall govern. The Contractor shall promptly notify the Engineer in writing of such differences. Should the Contractor perform any work that does not comply with the requirements of the applicable building codes, federal and state laws, local ordinances, industry standards and utility company regulations, he shall bear all costs arising in correcting the deficiencies. Applicable codes and standards shall include all State laws, State Board of Health and State Rating Bureau, local ordinances, utility company regulations and the applicable requirements of the following:
 - 1. National Electric Code – NFPA 70
 - 2. Standard Building Code
 - 3. National Fire Protection Association - NFPA
 - 4. National Electrical Manufacturers Association - NEMA
 - 5. National Bureau of Standards
 - 6. American National Standards Institute – ANSI
 - 7. Underwriter's Laboratories – UL

1.4 COOPERATION:

- A. Cooperate with others in laying out the electrical work so that this phase of the work will properly fit

the building and other contractor's requirements.

1.5 PRODUCTS FURNISHED BY OTHERS:

- A. Products are furnished by the Owner or under other Divisions of these Specifications that require electrical connection. This Contractor shall provide all necessary materials and labor to connect to the electrical system all equipment and fixtures having electrical power connection requirements. Refer to other Divisions of these specifications for additional or specific requirements. Actual rough-in dimensions shall be obtained from Shop Drawings or measurements of the equipment or fixture.
- B. The unpacking, assembling, and setting of equipment furnished by the Owner or under other Divisions of these Specifications will be performed by others, unless stated otherwise.
- C. Because the manufacturer of the equipment purchased or supplied may vary slightly from that specified, as hereinbefore stated, some rearranging of the requirements may be necessary. This Contractor shall make connections as required by the actual equipment furnished.

1.6 SEQUENCING AND SCHEDULING:

- A. Construct work in sequence under provisions of applicable sections of these specifications.
- B. Power outages shall be scheduled with the Owner and other Contractors. Outages shall be at the convenience of the Owner.

1.7 APPROVAL OF MATERIALS AND EQUIPMENT:

- A. Whenever a material, article, or piece of equipment is identified on the Drawings or in these Specifications by reference to manufacturer's or vendor's name, trade name, catalog number or the like, it is so identified for the purpose of establishing a standard of quality and shall not be construed as limiting competition. Any material, article, or piece of equipment of other manufacturers or vendors, which will perform adequately the intent of the design, will be considered equally acceptable provided written approval has been granted by the Engineer. Materials submitted for approval shall comply with all applicable Sections of these Specifications prior to acceptance. Submit proposed substitutions to the Architect for approval at least ten (10) days prior to the bid so that an addendum can be issued to all contractors. Engineer's opinion shall be final on the equality of substituted items.
- B. After the Contract has been awarded, catalog cuts on the following items shall be submitted to the Architect/Engineer for final approval before purchase of the equipment whether substitutions are being made or not:
 - 1. Light Fixtures
 - 2. Panelboards and Switchboards
 - 3. Distribution Equipment
 - 4. Wiring Devices
 - 5. Fabricated Equipment
 - 6. Automatic Transfer Switches

1.8 OBSERVATION, TESTING, AND BALANCING:

- A. Observation: The complete job will be, during and/or after construction, subject to the administration of the Engineer. Site visit(s) shall be conducted by the Architect/Engineer or his designated representative as necessary to maintain compliance with the Contract requirements.
- B. Balancing: All branch circuits and feeders shall be tested under typical load conditions (under maximum load conditions if so desired/requested by general contractor or engineer), and loads shall be balanced on the phases of the electrical system.
- C. **Prior to disconnecting existing panels/equipment, phase rotation shall be field-verified and noted. Prior to reconnection, verify so existing phase rotation is maintained.**

1.9 WORKMANSHIP:

- A. All work shall be executed in a neat and substantial manner by skilled workman, well qualified, and regularly engaged in the type of work required. Substandard work shall be removed and replaced by the Contractor at no cost to the Owner.

1.10 OPERATING AND MAINTENANCE INSTRUCTIONS/AS BUILT DRAWINGS:

- A. Four (4) complete sets of instructions containing the manufacturer's operating and maintenance instructions for each piece of equipment shall be furnished to the Owner. Each set shall be permanently bound and shall have a hard cover. One complete set shall be furnished at the time that the test procedure is submitted, and remaining sets shall be furnished before the Contract is completed. Flysheets shall be placed before instructions covering each subject. The instruction sheets shall be approximately 8-1/2" by 11" with large sheets of Drawings folded in. The instructions shall include information for major pieces of equipment and systems.
- B. Upon completion of the work and at the time designated, the services of one project engineer shall be provided by the Contractor to instruct the representative of the Owner in the operation and maintenance of the systems.
- C. This Contractor shall provide as-built Drawings at the completion of the job. Drawings shall show all significant changes in equipment, wiring, routing, location, etc.

1.11 GUARANTEE

- A. This Contractor shall guarantee to the Owner, all work performed under this contract to be free from defects in workmanship and material for a period of one year from date of final acceptance by Owner and Architect. Any defects arising during this period will be promptly remedied by the Contractor without cost to the Owner. Lamps and fuses burned out during normal operation after acceptance are exempt from guarantee. This Contractor shall furnish the Owner with an estimated time, from notification of a problem to presence on the site, for all service calls on warranty items.

1.12 COMPLIANCE:

- A. In the event of a conflict between Specifications, Drawings, Codes, Requirements, etc., the most stringent requirements shall govern.
- B. The interpretation of conflicts and resolution thereof shall remain the right of the Architect/Engineer or his designated representative.

PART 2 PRODUCTS: Not Used PART 3

EXECUTION: Not Used

END OF SECTION 260000

SECTION 260519 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS, CABLES, & DEVICES

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Section 260000 – Electrical General Requirements apply to the work specified in this section, with additions and modifications specified herein.

1.2 SECTION INCLUDES:

- A. Wire and Cable
- B. Wiring Devices

PART 2 PRODUCTS

2.1 WIRE AND CABLE

A. Building Wire:

1. Feeder and Branch Circuits 10 AWG and Smaller: Copper, solid conductor, 600 volt insulation, rated 75 degrees C, THHN/THWN.
2. Feeder and Branch Circuits 8 AWG and 6 AWG: Copper, stranded conductor, 600 volt insulation, rated 75 degrees C, THHN/THWN.
3. Feeder and Branch Circuits Larger Than 6 AWG: Copper, stranded conductor, 600 volt insulation, rated 75 degrees C, THW.
4. Control Circuits: Copper, stranded conductor, 600 volt insulation, THHN/THWN.

NOTE: The use of Romex cable is not allowed on this project. MC (metal clad) cable may be used where applicable and approved by local AHJ and **ARCHITECT/OWNER**. Aluminum wire may be used for feeder conductors provided the local AHJ and **OWNER** approve and the minimal allowable ampacity (as specified) is met.

B. Remote Control Signal Cable (where applicable):

1. Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600 volt insulation, rated 60 degree C, individual conductors twisted together, shielded, and covered with PVC jacket.
2. Control Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 60 degree C, individual conductors twisted together, shielded, and covered with PVC jacket; UL listed.

- C. Cords: Oil-resistant thermoset-insulated multi-conductor flexible cord with identified equipment grounding conductor, suitable for extra hard usage in damp locations, type SO.

2.2 WIRING DEVICES AND WALL PLATES:

A. Manufacturers:

1. Hubbell
2. Leviton
3. Arrow Hart
4. Or Equal

B. Wall Switches: AC general use, quiet-operating snap switch rated 20 amperes and 120/277 volts AC, with plastic toggle handle, ivory color unless noted otherwise on architectural drawings.

1. Single Pole Switch: Hubbell 1221-I (or equal)
2. Three Way Switch: Hubbell 1223-I (or equal)

C. Receptacle:

1. Convenience Receptacle Configuration: Type 5-20R, plastic face, ivory color. Model 5262-I manufactured by Hubbell (or equal).
2. Specific Purpose Receptacle: Configuration indicated on Drawings with black plastic face.
3. Provide straight-blade receptacles to NEMA WD 1.
4. Provide straight-blade receptacles to NEMA WD 5.
5. GFCI Receptacles: Duplex convenience receptacle with integral ground fault current interrupter. Model GFR-5352IA manufactured by Hubbell (or equal). Device shall be compliant to the requirements of UL 943.

D. Wall Dimmer: Rotary dial or slide type, ivory color. Model C-2000 manufactured by Lutron. (or equal) Rating of 2000 watts at 120 volts, AC.

E. Decorative Cover Plate: Smooth Stainless steel, ivory color, ANSI 302.

F. Weatherproof Cover Plate: Gasketed cast metal with hinged gasketed device covers rated raintight while in use in accordance with Article 410-57 of the National Electrical Code.

G. Attachment Plug Cap: Match receptacle configuration provided for equipment connection.

H. Cord Reels: Provide cord reels as indicated on the drawings. Cords shall be sized per loads served and shall be 50' in length.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION:

- A. Verify that interior of building has been physically protected from weather.
- B. Verify that mechanical work which is likely to injure conductors has been completed.
- C. Completely and thoroughly swab raceway system before installing conductors.

3.2 INSTALLATION:

- A. Wiring Methods:
 - 1. Concealed Interior Locations: Building wire in raceway.
 - 2. Exposed Interior Locations: Building wire in raceway.
 - 3. Above Accessible Ceilings: Building wire in raceway.
 - 4. Wet or Damp Interior Locations: Building wire in raceway.
 - 5. Exterior Locations: Building wire in raceway.
 - 6. Underground Locations: Building wire in raceway.
 - 7. Hazardous Locations: Building wire in raceway conforming to applicable NEC Articles as identified on the Drawings.
- B. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring. Conductors shall be sized to compensate for voltage drop.
- C. Neatly train and secure wiring inside boxes, equipment, and panelboards.
- D. Use UL listed wire pulling lubricant for pulling conductors in raceways.
- E. Make splices, taps, and terminations to carry full ampacity of conductors without perceptible temperature rise.
- F. Devices shall mount flush or as indicated on the Drawings.
- G. Install wiring devices in accordance with manufacturer's instructions.
 - 1. Install wall switches 48 inches above floor, "OFF" position down.
 - 2. Install wall dimmers 48 inches above floor. De-rate ganged dimmers as instructed by manufacturer. Do not use a common neutral, provide a separate neutral for each dimmed circuit.
 - 3. Unless noted otherwise, install convenience receptacles 18 inches above floor, 6 inches

above counters or backsplash, with grounding pole on bottom.

4. Install GFCI receptacles at all outdoor locations and all indoor locations as required by NFPA70, and as indicated.
 5. Install specific purpose receptacles at heights shown on Drawings.
 6. Install cord and attachment plug caps on equipment where acceptable and approved by all local AHJ's... and deemed necessary. Size cord for connected load and rating of branch circuit overcurrent protection.
- H. Install wall plates flush and level.
1. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
 2. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
 3. Install weatherproof cover plates on all devices/boxes in wet or outdoor locations.

3.3 FIELD QUALITY CONTROL:

- A. Perform field inspection and testing of circuits under provisions of Section 16000.
1. Inspect wire and cables for physical damage and proper connection.
 2. Torque test conductor connections and terminations to manufacturer's recommended values.
 3. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

END OF SECTION 260519

SECTION 260530 – RACEWAY SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Section 260000 - Electrical General Requirements, apply to the work specified in this section, with additions and modifications specified herein.

1.2 SECTION INCLUDES:

- A. Conduit and Conduit Fittings
- B. Electrical Boxes and Fittings
- C. Cable Tray PART 2

PRODUCTS

2.1 CONDUIT AND FITTINGS:

A. Conduit:

1. Metal Rigid Conduit: Galvanized steel.
2. Metal Tubing: Galvanized steel.
3. Flexible Conduit: Steel.
4. Liquid-Tight Flexible Conduit: Flexible conduit with PVC Jacket.
5. Plastic Conduit and Tubing: NEMA TC 2; PVC. Use Schedule 40 conduit.

B. Conduit and Fittings:

1. Conduit Fittings and Conduit Bodies: NEMA FB 1. Conduit fittings to be steel, threaded type. Split couplings are not acceptable.
2. Tubing Fittings: NEMA FB 1. Tubing fittings to be steel compression type for conduit up to 2" in diameter and set screw type for conduit 2-1/2" and larger.
3. Flexible Conduit Fittings: NEMA FB 1. Flexible conduit fittings to be steel set screw or screw in type.
4. Liquid-Type Flexible Conduit Fittings: NEMA FB 1. Liquid-tight flexible conduit fittings to be steel compression type.
5. Plastic Fittings and Conduit Bodies: NEMA TC 3.

2.2 ELECTRICAL BOXES:

A. Boxes:

1. Sheet Metal: NEMA OS 1; galvanized steel, 4" or 4-11/16" square. Provide galvanized plaster/tile ring for recessed outlet boxes.
2. Cast Metal: Aluminum or cast fer alloy, deep type, gasketed cover, threaded hubs.
3. Nonmetallic: NEMA OS 2.

- B. Large Enclosures: NEMA 250; Type 4, steel enclosures with manufacturer's standard enamel finish and cover, held closed screws.

2.3 CABLE TRAY (where applicable):

A. Manufacturers:

1. B-line
2. Mono-Systems

- B. Ladder type, constructed of aluminum with 9" rung spacing, 6" siderails and 18" wide

- C. Fittings: Horizontal 90° elbows, horizontal tees, and horizontal crosses with all metal accessories to connect to straight sections.

- D. Support: Supports shall be fabricated channel, and threaded rods.

- E. Grounding: Provide grounding straps as each junction, splice, fitting, etc. PART

3 EXECUTION

3.1 EXAMINATION AND PREPARATION:

- A. Examine supporting surfaces to determine that surfaces are ready to receive work.
- B. Electrical boxes shown on Contract Drawings are approximate locations unless dimensioned.

3.2 INSTALLATION:

- A. Use conduit and tubing for raceways in the following locations:

1. Underground Installations: Rigid steel conduit, painted with two coats of epoxy asphaltum paint, or PVC conduit.
2. Installations In Concrete: Rigid steel conduit, or PVC conduit.
3. In Slab Above Grade: Rigid steel conduit, or PVC conduit.

4. Exposed Outdoor Locations: Rigid steel conduit where damage from an external source is likely. Otherwise, schedule 80 PVC may be used.
 5. Wet Interior Locations: Rigid steel conduit or electrical metallic tubing. Use threaded or raintight fittings for conduit.
 6. Concealed Dry Interior Locations: Rigid steel conduit or electrical metallic tubing. Raceway to be installed concealed inside walls unless otherwise noted on plans. Where the electrical contractor foresees that installation inside a wall may be difficult or conflict with another system or construction, EC to verify with GC/Architect prior to surface-mounting.
 7. Exposed Dry Interior Locations: Rigid steel conduit or electrical metallic tubing.
 8. Feeders: Galvanized rigid steel conduit on all feeders.
- B. Size raceways for conductor type installed.
1. Minimum Size Conduit: 1/2 inch.
- C. Arrange conduit and tubing to maintain headroom and to present a neat mechanical appearance.
1. Route exposed raceway parallel and perpendicular to walls and adjacent piping.
 2. Maintain minimum 6 inch clearance to piping and 12 inch clearance to heat surfaces such as flues, piping, roof decks, and heating appliances.
 3. Maintain required fire, acoustic, and vapor barrier rating when penetrating walls, floors, and ceilings.
 4. Route conduit through roof openings for piping and ductwork where possible; otherwise, route through roof jack with pitch pocket.
 5. Group in parallel runs where practical. Use rack constructed of steel channel. Maintain spacing between raceways or de-rate circuit ampacities to NFPA 70 requirements.
 6. Use approved manufactured conduit hangers and clamps; do not fasten with wire or perforated pipe straps. Utilize conduit hangers for conduits located below floor slabs.
 7. Use conduit bodies to make sharp changes in direction.
 8. Terminate all conduits with insulated bushings.
 9. Use suitable caps to protect installed raceway against entrance of moisture and dirt.
 10. Provide a pull string in all empty raceways.
 11. Install expansion joints fittings where raceway crosses building expansion joints.
 12. Install plastic conduit and tubing in strict accordance with the manufacturer's

recommendations. When plastic conduit is installed, use galvanized rigid elbows for 90E bends.

- D. Install electrical boxes as shown on the Drawings, and as required for splices, taps, wire pulling, equipment connections and regulatory requirements.
1. Use cast outlet box in exterior locations, wet locations, and exposed interior locations.
 2. Use large enclosure for interior pull and junction boxes larger than 12 inches in any dimension.
 3. Locate and install electrical boxes to allow access. Provide access panels if required.
 4. Locate and install electrical boxes to maintain headroom and to present a neat mechanical appearance.
 5. Install pull boxes and junction boxes above accessible ceilings or in unfinished areas.
 6. Provide knockout closure for unused openings.
 7. Align wall-mounted outlet boxes plumb and level for switches, and similar devices.
 8. Coordinate mounting heights and locations of outlets above counters and backsplashes.
 9. Install lighting outlets to locate luminaires as shown on the Drawings.
- E. Use recessed outlet boxes in finished areas where indicated.
1. Secure boxes to interior wall and partition studs, accurately positioning to allow for surface finish thickness, and plaster/tile ring installation.
 2. Use stamped steel stud bridges for flush outlets in hollow stud wall, and adjustable steel channel fasteners for flush ceiling outlet boxes.
 3. Locate boxes in masonry walls to require cutting corner only. Coordinate masonry cutting to achieve neat openings for boxes.
 4. Do not install boxes back-to-back in walls; provide 6-i n c h separation, minimum. In acoustic-rated walls provide 24-inch separation minimum.
 5. Do not damage insulation. END

OF SECTION 260530

SECTION 262713 – SERVICE & DISTRIBUTION

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Section 260000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

1.2 SECTION INCLUDES:

- A. System Description
- B. Utility Requirements
- C. Grounding
- D. Switchboards
- E. Panelboards
- F. Enclosed Switches
- G. Fuses
- H. Transformers
- I. Enclosed Circuit Breakers
- J. Plug-in Duct

1.3 SYSTEM DESCRIPTION:

- A. The existing service is 120/208V, 3-phase, 4-wire. Refer to 'Power Riser Diagram' for details. The EC shall field-coordinate with the utility company prior to construction to confirm method of relocating service feeders and all requirements.

1.4 PROJECT CONDITIONS:

- A. Verify field measurements for the equipment to ensure proper fit within the space proposed.

1.5 UTILITY REQUIREMENTS:

- A. The existing serving utility is FP&L. Existing 120/208V, 3-phase, 4 wire, underground service fed from an existing padmount transformer is to remain.
- B. If required, metering shall be provided by the utility company and installed by electrical contractor.

1. Coordinate with the utility for exact metering requirements.
2. Install metering devices provided by the utility company.

PART 2 PRODUCTS

2.1 SWITCHBOARD:

A. Manufacturers:

1. Square D Company
2. ITE-Siemens
3. General Electric Company
4. Cutler Hammer
5. Or Equal

B. Switchboard: NEMA PB2.

1. Line and Load Terminations: Accessible from front only of switchboard, suitable for conductor materials used.
2. Main Sections Devices: Individually mounted.

C. Ratings: As shown on Drawings.

D. Bussing:

1. Bus Material: Copper or Aluminum with tin plating sized in accordance with NEMA PB2.
2. Bus Connections: Accessible from front for maintenance.
3. Ground Bus: Copper

E. Enclosure: Type 1 General Purpose as shown on the Drawings.

1. Align sections at front and rear.
2. Height: 90 inches
3. Finish: Manufacturer's standard light gray enamel over external surfaces.

F. Future Provisions:

1. Fully equip spaces for future devices with bussing and bus connection provisions; continuous current rating as indicated on the Drawings.

2. Do not taper main bus rating.

G. Switching and Over-Current Protection Devices:

1. Molded Case Circuit Breakers: NEMA AB 1.
2. Solid State Molded Case Circuit Breakers: NEMA AB 1; with electronic sensing, timing, and tripping circuits for adjustable current settings; ground fault trip; instantaneous trip and adjustable short time trip.

H. Switchboard Instruments:

1. Ground Fault Sensors: Zero sequence type.
2. Ground Fault Relay: Adjustable ground fault sensitivity from 200 to 1200 amperes, time delay adjustable from 0 to 1 second.
3. Square D Power Logic metering.

2.2 PANELBOARDS:

A. Manufacturers:

1. Square D Company
2. ITE-Siemens
3. General Electric Company
4. Cutler Hammer
5. Or Equal

B. Distribution Panelboards: NEMA PB 1; circuit breaker type.

1. Enclosures: Type 1 or 3R as shown on Drawings.
2. Mounting: Surface or flush mount as shown on Drawings.
3. Bus: Copper.
4. Ground Bus: Copper
5. Voltage and phase: As shown on Drawings.
6. Minimum Integrated Equipment: As shown on Drawings.

7. Hinged door with lock.
 8. Circuit Breakers: Bolt-on, ratings as shown on Drawings.
- C. Light and Power Panelboards: NEMA PB 1; circuit breaker type.
1. Enclosures: Type 1 or 3R as shown on Drawings.
 2. Surface or flush mount as shown on Drawings.
 3. Bus: Copper.
 4. Ground Bus: Copper.
 5. Voltage and phase as shown on Drawings.
 6. Minimum Integrated Equipment: As shown on Drawings.
 7. Hinged door with lock.
 8. Circuit Breakers: Bolt-on, ratings as shown on Drawings.
- D. Accessories: Provide panel and branch device accessories as shown on Drawings.
- E. Future Provisions: Where space provisions are indicated on the Drawings provide bussing, bus extensions, etc. require to mount future circuit breakers. Where spare provisions are indicated on the Drawings provide circuit breakers complete and ready for connection.

2.3 ENCLOSED SWITCHES:

- A. Manufacturers:
1. Square D Company
 2. ITE-Siemens
 3. General Electric Company
 4. Cutler Hammer
 5. Or Equal
- B. Enclosed Switch Assemblies: NEMA KS 1; Type HD.
1. Fuse Clips: Designed to accommodate Class `R' or `J' fuses as shown on Drawings.
- C. Enclosures: NEMA KS 1; Type 1 or 3R as required.
- D. Ground: Provide grounding lug.

- E. Ratings: 600 or 250 volts to match system service requirements, poles and ampere ratings as indicated on the Drawings.

2.4 FUSES:

A. Manufacturers:

- 1. Bussman
- 2. Shawmut
- 3. Little Fuse

B. Service Entrance/Feeder Circuits-601 Amp and Larger

- 1. Current Limiting
- 2. UL Class L
- 3. 200,000 Ampere RMS Interrupting Rating
- 4. Voltage Rating: As required for system compatibility.

C. Service Entrance/Feeder Circuits-600 Amp and Smaller

- 1. Current Limiting
- 2. UL Class RK1
- 3. 200,000 Ampere RMS Interrupting Rating
- 4. Voltage Rating: As required for system compatibility

D. Motor, Motor Controller, Transformer, and Inductive Circuits

- 1. Current Limiting
- 2. UL Class RK1, Time Delay
- 3. 200,000 Ampere RMS Interrupting Rating
- 4. Voltage Rating: As required for system compatibility.

2.5 TRANSFORMERS:

A. Manufacturers:

1. Square D Company
2. ITE-Siemens
3. General Electric Company
4. Cutler Hammer
5. Or Equal

B. Description: Enclosed air-cooled dry type transformer.

C. Ratings:

1. Primary Voltage: As shown on Drawings.
2. Secondary Voltage: As shown on Drawings.
3. Capacity: KVA ratings as shown on Drawings.
4. Basic Impulse Level: 10 BIL.
5. Insulation Class/Temperature Rise: Class 220/115 degrees C.

D. Configuration: Two winding, delta-wye.

E. Winding Taps: Four full capacity primary taps, each at 2.5 percent below rated voltage; and two full capacity primary taps, each at 2.5 percent above rated voltage.

F. Mounting: Wall, floor, or trapeze as shown on Drawings.

G. Enclosures: Code gauge steel, NEMA 1 or 3R as required.

2.6 ENCLOSED CIRCUIT BREAKERS:

A. Manufacturers:

1. Square D Company
2. ITE-Siemens
3. General Electric Company
4. Cutler Hammer
5. Or Equal

B. Circuit Breaker: NEMA AB 1.

1. Voltage: As shown on Drawings.
2. Enclosure: NEMA AB 1; Type 1 or 3R as required.
3. Accessories: As indicated on Drawings.

2.7 PLUG-IN DUCT

A. Manufacturers:

1. Square D Company
2. ITE-Siemens
3. General Electric
4. Cutler Hammer
5. Or Equal

B. Plug-in Duct

1. Bus Material: Copper
2. Enclosure: NEMA 1
3. Mounting: Suspended from structure
4. Rating: 225 amperes, 600 volt, 3 phase, 4 wire

C. Plug-in Units

1. Fusible switches PART

3 EXECUTION

3.1 EXAMINATION AND PREPARATION:

- A. Make arrangements with utility company to obtain permanent electrical service to the facility.
- B. Provide concrete pad for utility transformer. Pad details on the Drawings are for estimating purposes. Coordinate exact pad requirements with the utility prior to installation.

3.2 INSTALLATION:

- A. Install utility services in accordance with utility company standards and requirements.

1. Underground Service: Install service entrance conduits and conductors from the utility pad mounted transformer to the service equipment as shown on the Drawings. (Verify with utility prior to bid/construction.) In addition, coordinate with utility company for required provisions for utility owned underground primary cabling.
 2. If applicable...provide lugs on utility transformer spaces sized to accommodate service entrance conductors.
- B. Install equipment in accordance with manufacturer's instructions.
- C. Install switchboard to NEMA PB 2.1.
- D. Install panelboards to NEMA PB 1.1.
- E. Ground the electrical service in accordance with NFPA 70, National Electrical Code, Article 250.
- F. Provide labels for all switchboards, panelboards, and distribution equipment.
- G. Provide typewritten directory inside panel door for all panelboards. END OF

SECTION 262713

SECTION 265000 – BASIC ELECTRICAL MATERIALS & METHODS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Section 260000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

1.2 SECTION INCLUDES:

- A. Grounding and Bonding
- B. Supports
- C. Identification
- D. Connection of Equipment
- E. Excavation, Trenching, and Backfilling
- F. Cleaning and Painting
- G. Cutting and Patching

1.3 PROJECT CONDITIONS:

- A. Existing project conditions indicated on Drawings are based on casual field observation and existing record documents.
- B. Verify field measurements and circuiting arrangements as shown on the Drawings.
- C. Report discrepancies to Engineer before disturbing existing installation.

PART 2 PRODUCTS

2.1 GROUNDING MATERIALS:

- A. Ground Rod: Copper clad steel, 3/4 inch in diameter x 10 feet in length.
- B. Mechanical Connectors: Cast bronze construction with matching bolt, nuts, and washers.
- C. Exothermic Welds: Materials shall be from the same source. Materials shall be Cadweld or approved equal.
- D. Conductors: Insulated type complying with applicable Sections of these Specifications or bare soft drawn copper as indicated.

2.2 SUPPORTS:

- A. Fabrication Steel: Galvanized or painted steel of standard shapes and sizes.
- B. Manufactured Channel: Hot dipped galvanized with all hardware required for mounting as manufactured by

Unistrut, Kindorf, Powerstrut, or equal.
- C. Miscellaneous Hardware: Standard sizes treated for corrosion resistance.

2.3 IDENTIFICATION:

- A. Panel Nameplates: Engraved three-layer laminated plastic, black letters on white background.
- B. Additionally, Main Panel Nameplates to include Phase Rotation.
- C. Panel Directories: Typewritten under plastic cover.
- D. Receptacles and disconnects to be provided with label denoting panel and breaker.
- E. Provide permanently mechanically-affixed tag on transformers denoting source panel and transformer identification.
- F. Wire and Cable Markers: Cloth type, split sleeve type, or tubing type.

PART 3 EXECUTION

3.1 INSTALLATION:

- A. Install Products in accordance with manufacturer's instructions.
- B. Except where specifically indicated otherwise, all exposed non-current-carrying metallic parts of electrical equipment, metallic raceway systems, and service neutral of the electrical system shall be grounded.
 - 1. Equipment grounding shall be accomplished by installing a separate grounding conductor in each raceway of the system. The Conductor shall be provided with a distinctive green insulation or marker and shall be sized in accordance with Table 250-122 of the National Electrical Code for circuit ampacity ratings.
 - 2. The electrical system grounding electrode shall be made at the main service equipment and shall be extended to the point of entrance of the metallic coldwater service. Ground to be sized in accordance with Table 250-66 of the National Electrical Code. Connection to the water pipe shall be made by a suitable ground clamp. If flanged pipes are encountered, connection shall be made on the street side of the flange connection. If the metallic water service is coated with an insulating material or there is no metallic water service to the building, ground connection shall be made to ground rods at the exterior of the building driven full length into the earth. The maximum resistance of the driven ground shall not exceed 25 ohms under normally dry

conditions. If this resistance cannot be obtained with a single rod, additional rods shall be installed not less than 6 feet on centers, or if sectional type rods are used, additional sections may be coupled together and driven with the first rod. The resultant resistance shall not exceed 25 ohms measured not less than 48 hours after rainfall.

3. Ground all building steel including reinforcing bars in concrete and all piping entering the building from outside. Where applicable, see Section 16900 for additional requirements.
- C. Make electrical connections to equipment in accordance with equipment manufacturer's instructions.
1. Verify that wiring and outlet rough-in work is complete and that equipment is ready for electrical connection, wiring, and energization.
 2. Make wiring connection in control panel or in wiring compartment of pre-wired equipment. Provide interconnecting wiring as required by equipment manufacturer.
 3. Install and connect disconnect switches, controllers, control stations, and control devices as required by equipment manufacturer.
 4. Make conduit connections to equipment using flexible conduit. Use liquid-tight flexible conduit in damp or wet locations.
 5. Install pre-fabricated cord set where connections with attachment plug is indicated or specified, or use attachment plug with suitable strain-relief clamps.
 6. Provide suitable strain-relief clamps for cord connections to outlet boxes and equipment connection boxes.
- D. Install support systems sized and fastened to accommodate weight of equipment and conduit, including wiring, which they carry.
1. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using precast insert system, expansion anchors, preset inserts, beam clamps, or spring steel clips.
 2. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion and anchors on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
 3. Do not fasten supports to piping, ceiling support systems, ductwork, mechanical equipment, conduit, etc.
 4. Do not use powder-actuated anchors.
 5. Do not drill structural steel members.
 6. Fabricate supports from structural steel or steel channel.
 7. Install surface mounted cabinets and panelboards with minimum of four anchors.
 8. Provide steel channel supports to stand cabinets one inch off wall in wet locations.
 9. Bridge studs top and bottom with channels to support flush mounted cabinets and panelboards in stud walls.
 10. Install free-standing electrical equipment on 4-inch-high concrete pads.
- E. Identify electrical distribution and control equipment, and loads served, to meet regulatory

requirements and as specified herein.

1. Degrease and clean surface to receive nameplates.
 2. Secure nameplates to equipment fronts using screws or rivets with edges parallel to equipment lines.
 3. Use nameplates with ¼ inch lettering to identify Switchboard, Panelboards, Safety Switches, Motor Starters and Branch Devices of Switchboards.
 4. Panel directories shall accurately indicate load served and location of load.
 5. Engrave plates as indicated by Schedules on the Drawings.
- F. Install wire markers on each conductor in panelboard gutters, boxes, and at load connections.
1. Use distribution panel and branch circuit or feeder number to identify power and lighting circuits.
 2. Use control wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings to identify control wiring.
- G. Excavating, trenching, and backfilling shall be accomplished as indicated on the Drawings or where required to install systems and/or equipment.
1. Trenches for all underground conduits or equipment shall be excavated to the required depths. Where soft, wet, or unstable soil is encountered, the bottom of the trench shall be filled with 6 inches of compacted gravel and sand fill. All trench bottoms shall be tamped hard. Trenches shall be shored as required to meet OSHA requirements and general safe working conditions.
 2. After conduits or equipment have been inspected and approved by the Architect and prior to backfilling, all forms shall be removed and the excavation shall be cleaned of all trash and debris. Material for backfilling shall consist of the excavation, or borrow of sand, gravel, or other materials approved by the Architect and shall be free of trash, lumber, or other debris. Backfill shall be placed in horizontal layers, not exceeding 9 inches in depth and properly moistened to approximate optimum requirements. Each layer shall be compacted by hand or machine tamped to a density equivalent to surrounding soil.
- H. Cleaning and Painting: The respective Contractors for the various phases of work shall clear away all debris, surplus materials, etc., resulting from their work or operations, leaving the job and equipment furnished in the clean first-class condition.
1. All fixtures and equipment shall be thoroughly cleaned of plaster, stickers, rust, stains and other foreign matter or discoloration, leaving every part in an acceptable condition ready for use.
 2. The Contractor shall refinish and restore to the original condition and appearance, all electrical equipment which has sustained damage to manufacturer's prime and finish coats or enamel or paint. Materials and workmanship shall be equal to the requirements described for other painting.
- I. Cutting and Patching: This Contractor shall provide all cutting, digging, etc., incident to his work and shall make all required repairs thereafter to the satisfaction to the Engineer, but in no case shall the Contractor cut into any major structural element, beam, or column without written approval of the Engineer.

1. Pavements, sidewalks, roads, curbs, walls, ceilings, floors, and roofs shall be cut, patched, repaired and/or replaced as required to permit the installation of the electrical work.
2. The Contractor shall bear the expense of all cutting, patching, painting, repairing, or replacing of the work of other trades required because of his fault, error, or tardiness or because of any damage done by him.

END OF SECTION 265000

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 265100 - LIGHTING

PART 1 GENERAL

Luminaire Schedule: Product requirements for each luminaire are specified in luminaire schedule on Drawings. EQUALS MUST BE SUBMITTED TO ARCHITECT/ENGINEER FOR APPROVAL 10 DAYS PRIOR TO SUBMITTING BID.

1.1 SUMMARY

A. Section includes the following types of LED luminaires:

1. Cylinder.
2. Downlight.
3. Lowbay.
4. Recessed linear.
5. Strip light.
6. Surface mount, linear.
7. Surface mount, nonlinear.
8. Suspended, linear.
9. Suspended, nonlinear.
10. Materials.
11. Finishes.
12. Luminaire support.

1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. LED: Light-emitting diode.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product, arranged by designation.
- B. Shop Drawings: For nonstandard or custom luminaires.

1. Include plans, elevations, sections, and mounting and attachment details.
2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

C. Product Schedule: For luminaires and lamps, Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.
- B. Product Certificates: For each type of luminaire.
- C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

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 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE 7.

2.2 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. Standards:
 1. ENERGY STAR certified.

2. California Title 24 compliant.
 3. NRTL Compliance (where applicable): Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
 4. FM Global Compliance (where applicable): Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
 5. UL Listing: Listed for damp location.
 6. Recessed luminaires shall comply with NEMA LE 4.
- C. CRI of minimum 80. CCT of minimum 2700 K (interior fixtures) and minimum 4000 K (exterior fixtures unless noted otherwise on drawings).
- D. Rated lamp life of 50,000 hours to L70.
- E. Lamps dimmable from 100 percent to 0 percent of maximum light output.
- F. Internal driver.
- G. Nominal Operating Voltage: 120-277 V ac (unless specified otherwise on drawings).
1. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
- H. Housings:
1. Extruded-aluminum housing and heat sink.
 2. Fixture dependent; refer to 'LIGHTING FIXTURE SCHEDULE' on drawings.
- 2.3 CYLINDER wall-mounted luminaires, used for direct or indirect lighting.
- A. If 'Other Than Specified' fixtures are to be considered as equal for bidding, equal fixture shall be submitted to Architect/Engineer a minimum of 10 days prior to submitting bid. Refer to drawings to confirm if equals accepted.
 - B. Minimum 1000 lumens. Minimum allowable efficacy of 80 lumens per watt.
 - C. With integral mounting provisions.
- 2.4 DOWNLIGHT
- A. Minimum 1,000 lumens. Minimum allowable efficacy of 80 lumens per watt.
 - B. Universal mounting bracket.
 - C. Integral junction box with conduit fittings.
 - D. Optics:
 1. Refer to drawings to determine if fixtures are to have Fixed or Adjustable lens.
 2. Refer to drawings to determine Spot/[Medium]/[Wide light distribution.

2.5 LOWBAY

- A. Minimum 5,000 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Universal mounting bracket.

2.6 RECESSED LINEAR

- A. Minimum 1,500 lumens. Minimum allowable efficacy of 85 lumens per watt.
- B. Integral junction box with conduit fittings.

2.7 STRIP LIGHT

- A. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Integral junction box with conduit fittings.

2.8 SURFACE MOUNT, LINEAR

- A. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Integral junction box with conduit fittings.

2.9 SURFACE MOUNT, NONLINEAR

- A. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- B. Integral junction box with conduit fittings.

2.10 SUSPENDED, LINEAR

- A. Minimum 1,500 lumens. Minimum allowable efficacy of 85 lumens per watt.

2.11 SUSPENDED, NONLINEAR

- A. Minimum 1,500 lumens. Minimum allowable efficacy of 85 lumens per watt.
- B. Integral junction box with conduit fittings.

2.12 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. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

C. Diffusers, and Globes:

1. Acrylic: One hundred percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
2. Glass: Annealed crystal glass unless otherwise indicated.
3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

D. Housings:

1. Extruded-aluminum housing and heat sink.
2. Refer to drawings for type of finish.

2.13 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.

2.14 LUMINAIRE SUPPORT

- A. Comply with requirements in Section 16400 "Basic Electrical Materials & Methods" 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. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- D. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 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: Sized and rated for luminaire weight.
- E. Flush-Mounted Luminaire Support: Secured to outlet box.
- F. Wall-Mounted Luminaire Support:
 - 1. Attached to structural members in walls, to a minimum 20 gauge backing plate attached to wall structural members, or using through bolts and backing plates on either side of wall.
 - 2. Do not attach luminaires directly to gypsum board.
- G. Ceiling-Mounted Luminaire Support:
 - 1. Ceiling mount with minimum one (1) 5/32-inch diameter aircraft cable supports 120 inches in length.
 - 2. Ceiling mount with pendant mount with 5/32-inch diameter aircraft cable supports adjustable to [120 inches in length.
 - 3. Ceiling mount with hook mount.
- H. Suspended Luminaire Support:
 - 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. Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of luminaire chassis, including one at each end.
 - 4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.
- I. Ceiling-Grid-Mounted Luminaires:
 - 1. Secure to any required outlet box.
 - 2. Secure luminaire using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
- J. Comply with requirements in Section 16100 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

3.2 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 265100

THIS PAGE INTENTIONALLY LEFT BLANK

PART 06 FIRE ALARM SPECIFICATIONS (WATFORD)

SECTION 283100 FIRE DETECTION AND ALARM

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. Fire alarm and smoke detection system.

1.02 REFERENCES:

- A. NFPA 13: Standard for the Installation of Sprinkler Systems.
- B. NFPA 13A: Recommended Practice for the Inspection, Testing and Maintenance of Sprinkler Systems.
- C. NFPA 70: National Electrical Code
- D. NFPA 72: Installation, Maintenance, and Use of Local Protective Signaling System.
- E. NFPA 72E: Automatic Fire Detectors.
- F. NFPA 72G: Notification Appliances for Protective Signaling Systems.
- G. NFPA 72H: Guide for Testing Procedure for Local, Auxiliary, Remote Station and Proprietary Protective Signaling Systems.
- H. NFPA 90: Standard for the Installation of Air Conditioning and Ventilating Systems.
- I. NFPA 101: Life Safety Code.

1.03 REGULATORY REQUIREMENTS:

- A. Systems: UL and FM listed.
- B. Conform to requirements of NFPA.
- C. Conform to requirements of Standard Building Code.
- D. Conform to requirements of American's with Disabilities Act - ADA.

1.04 SYSTEM REQUIREMENTS:

- A. **NO new addressable fire alarm control panel is to be required. The existing FACP is to remain and new devices are to furnished and connected to the existing system. New devices shall be 100% compatible with the existing system. Refer to drawing(s) for the exact manufacturer/model #.** Where applicable, the system shall include, but not be limited to the following elements.

- 1. Master system CPU including all fire detection.

2. Circuit interface panels including all modules.
3. Power supplies, batteries and battery chargers.
4. Equipment enclosures.
5. Intelligent addressable manual pull stations, heat detectors, analog smoke detectors, alarm monitoring modules, and supervised control modules.
6. Annunciator panels, printers and video display terminals.
7. Audible and visual evacuation signals.
8. Color graphic displays and historical archiving.
9. Software and firmware as required to provide a complete functioning system.
10. Wiring and raceway.
11. Installation, testing and certification and education labor.
12. Multipliex, system driven remote annunciator.

1.05 SYSTEM FUNCTION:

- A. The system shall be a complete, electrically supervised multiplex style fire detection and audio/visual evacuation system with intelligent analog alarm initiation, to be device addressable and annunciated as described and shown on the Drawings.
- B. The system shall support intelligent analog smoke detection, conventional smoke detection, manual station, water flow, supervisory, security, and status monitoring devices. The system shall also support audio/visual circuits.
- C. The panel shall be UL listed as a test instrument for the measurement of the sensitivity of connected intelligent analog ionization and photoelectric smoke detectors to comply with the testing requirements of NFPA 72E.
- D. The system shall annunciate a trouble condition when any smoke detector approaches 80% of its alarm threshold due to gradual contamination, signaling the need for service and eliminating unwanted alarms.
- E. Any intelligent analog smoke detector or conventional smoke detector zone shall include a selectable alarm verification capability. This feature shall provide automatic verification capability. This feature shall provide automatic verification of smoke detector alarms as described by NFPA 72E.
- F. The system shall recognize initiating of an alarm and indicate the alarm condition in a degrade mode of operation, in the event of processor failure or the loss of system communications to the circuit interface panels.
- G. The system shall provide a one person field test of either the complete system or a specified area, maintaining full function of areas not under test.

- H. The system shall be provided with eight levels of password protection with up to forty passwords.
- I. The system shall be programmed in the field via a laptop computer. All programmed information shall be stored in nonvolatile memory after downloading into the control panel. No special programming terminal or prom burning shall be required and the system shall continue in service during reprogramming. Systems requiring on line programming or not capable of mass uploading of software for offsite documentation or editing will not be considered acceptable.
- J. The system shall consist of central architecture using a single centrally located control unit. The system also shall be operable in a distributed multiplex architecture using a centrally located control unit with interconnection to remote circuit interface panels containing any combination of plug in intelligent analog signalling circuits, plug in conventional initiating device circuits and plug in relays.
- K. The system shall support a UL listed supervised printer.
- L. The system as installed shall be expandable to its predetermined maximum capacity of 3,000 initiation devices and/or 2,000 combined zones of audio/visual devices.

1.06 SYSTEM OPERATION:

- A. Activation of any fire alarm initiating device shall cause the following actions and indications:
 - 1. Display a custom message describing the device originating the alarm condition, at the fire alarm control panel LCD alpha numeric display. Remote LCD annunciators shall display the alarm condition via unique messages as required by the system Owner. LED type annunciator displays conventional and graphic style shall indicate alarm zoning as specified.
 - 2. Sound the audio/voice circuits, and activate the visual signals.
 - 3. Shut down all air handling units within the smoke zone of alarm origin.
 - 4. Furnish an alarm system closure for connection to an off site reporting device as contracted for by the system user, via a dialer provided under this Section. **THIS OPTION REQUIRED IF EXISTING SYSTEM (where applicable) IS NOT EQUIPPED TO PROVIDE THIS OPTION.**
 - 5. Close all smoke doors and smoke dampers (if any present in facility) shown on the Drawings to prevent the spread of smoke.
 - 6. Record within the non-volatile system historical memory the occurrence of the event, the time and date of occurrence and the device initiating the event.
- B. **WHERE APPLICABLE...** Activation of any smoke detector or two cross zoned smoke detectors in a single elevator lobby or an elevator equipment room shall, besides the actions described above, cause the recall of that bank of elevators to the terminal floor and the lockout of controls. In the event of recall initiation by a detector in the first floor lobby, the recall shall be to the alternate floor.
- C. Activation of any detector in an elevator hoistway or machine room shall cause the capture of that bank of elevators per local requirements, upon completion of these actions, activate the sprinkler system pre-action

release panel.

D. Activation of any supervisory circuit, shall cause the following actions and indications:

1. Display the origin of the supervisory condition report at the alarm control panel alphanumeric LCD display.
2. Activate supervisory audible and visual signals as indicated on the Drawings.
3. Furnish an alarm system closure for connection to an off site reporting device as contracted for by the system user.
4. Record the occurrence of the event, the time of occurrence and the device initiating the event.

E. Receipt of a trouble report (primary power loss, open or grounded initiating or signalling circuit wiring, open, grounded or shorted indication system wiring, device communication failure, battery disconnect) at the fire alarm control panel shall cause the following actions and indications:

1. Display at the alarm control panel alphanumeric LCD display, the origin of the trouble condition report.
2. Activate trouble audible and visual signals at the control panel and as indicated on the Drawings.
3. Furnish an alarm system closure for connection to an off site reporting device as contracted for by the system user, via a Dialer furnished under this Section.
4. Record the occurrence of the event, the time of occurrence and the device initiating the event.

1.07 SYSTEM ZONING:

- A. Each intelligent addressable device or conventional zone on the system shall be displayed at the fire alarm control panel by a unique alpha numeric label identifying its location.

1.08 QUALIFICATIONS:

- A. Manufacturer: Company specializing in smoke detection and fire alarm systems with five years experience and an office within 125 miles of job site.
- B. Installer: Company specializing in smoke detection and fire alarm system with three years experience.

1.09 SUBMITTALS:

- A. Submit shop Drawings and products data.
- B. Provide wiring diagrams, data sheets, and equipment ratings, layout, dimensions, and finishes. Include location of end-of-line devices.
- C. Submit manufacturer's installation instructions.

1.10 OPERATION AND MAINTENANCE DATA:

- A. Submit as-built Drawings indicating location of all devices, wiring, and end-of-line devices.
- B. Include operating instructions, and maintenance and repair procedures.
- C. Include manufacturer representative's letter stating that system is operational, and install in accordance with NFPA 72A, 72B, 72E, 72G and 101 and tested in accordance with NFPA 72H.

PART 2 PRODUCTS

2.01 MANUFACTURERS:

- A. Where new fire alarm systems are required, acceptable manufacturers are: Pyrotronics, Simplex, EST, Gamewell, Notifier, and FCI (Fire Control Instruments)

2.02 FIRE ALARM CONTROL PANEL:

- A. The control panel shall be modular in construction and shall include, but not limited to; the hardware, software and firmware required to perform system functions.
- B. The control panel shall be housed within a code gage steel enclosure flush wall mounted.
- C. System power supplies shall be housed within the enclosure. Primary power supply shall be from the building distribution system. Secondary power shall be provided by internal sealed gelled electrolyte batteries with capability to operate the system for eight (8) hours.
- D. The panel shall provide a system for maintaining a historical event record.

2.03 FIRE ALARM INITIATING DEVICES:

- A. Smoke Detector, Intelligent Ionization: The detector shall be addressable, dual chamber, self compensating for ambient temperature and humidity. Detectors shall be suitable for two wire operation.
- B. Smoke Detector, Intelligent Photoelectric: The detector shall be addressable, self compensating for ambient temperature and humidity with integral self, restoring 135 degree heat detector. Detectors shall be suitable for two wire operation.
- C. Smoke Detector, Intelligent Duct Type: The detector shall be addressable, self compensating for ambient temperature and humidity, ionization or photoelectric type as application requires.
- D. Smoke Detector, Projected Beam: The detector shall consist of an infrared light beam transmitter and a light receiver. The detector shall be self compensating for ambient and temperature changes.
- E. Thermal Detector, Intelligent: The detectors shall be addressable, rate compensated rated at 135 degrees or 200 degrees Fahrenheit. Detectors shall be suitable for two wire operation.
- F. Manual Pull Station, Intelligent: The pull station shall be addressable single station type. Pull stations shall be flush wall mounted.

2.04 ZONE AND INTERFACE MODULES:

- A. Remote Conventional Zone Module: Provide, for integration of compatible 2 wire and shorting style contact devices into the analog signaling circuit.
- B. Intelligent System Interface Module: Furnish and install, for the monitoring of contact type initiation devices and for the control of electrical devices where required.
- C. Intelligent Supervised Control Module: Furnish and install for the control of supervised relays, contractors, audible signal circuits, visual signal circuits, distributed speaker circuits and two way fire fighters communication circuits.

2.05 EVACUATION/SIGNALLING DEVICES:

- A. Evacuation Horn(Speaker)/Strobe. Provide audible horns with strobe as indicated on the Drawings. Integral strobe shall be flashing, polarized type with polycarbonate lens producing 8000 peak candlepower at one flash per second.
- B. Evacuation Strobe: Provide visual evacuation strobes at locations indicated on the Drawings. Strobes shall be flush wall mounted, flashing, polarized type with polycarbonate lens producing 8000 peak candlepower at one flash per second.

2.06 FIRE ALARM WIRE AND CABLE:

- A. Fire Alarm Power Circuits: Building wire as specified in Section 16300. Minimum size conductors shall be 12 AWG.
- B. Fire Alarm Loop Circuits: Analog loop circuits shall be 18 AWG twisted pair.
- C. Fire Alarm Speaker Circuits: Speaker circuits shall be 18 AWG twisted pair.
- D. Fire Alarm Initiating and Strobe Circuits: Circuits shall be minimum 14 AWG building wire as specified in Section 16300.

2.07 **DIALER: Provide dialer for off site notification where required locally. If existing system, verify if existing system is equipped with the local requirement.**

PART 3 EXECUTION

3.01 INSTALLATION:

- A. Install system in accordance with manufacturer's instructions.
- B. Install manual station with operating handle 48 inches above floor. Install audible and visual devices 80 inches above floor or as indicated.
- C. Install cables and wiring in conduit.

- D. Mount end-of-line device in control panel or in box with last device or separate box adjacent to last device in circuit.
- E. Make conduit and wiring connections to sprinkler flow switches, sprinkler valve tamper switches, duct smoke detectors, HVAC shutdown equipment, and elevator control equipment.
- F. Automatic Detector Installation: NFPA 72E.
- G. Provide surge suppression for all wiring of the fire alarm system.

3.02 FIELD QUALITY CONTROL:

- A. Field inspection and testing will be performed.
- B. Test in accordance with NFPA 72H and local fire department requirements.

3.03 MANUFACTURER'S FIELD SERVICES:

- A. Provide manufacturer's field services as required for installation.
- B. Include services of certified technician to supervise installation, adjustments, final connections, and system testing.
- C. Instruct Owner in operation and function of the system.

END OF SECTION 28 31 00

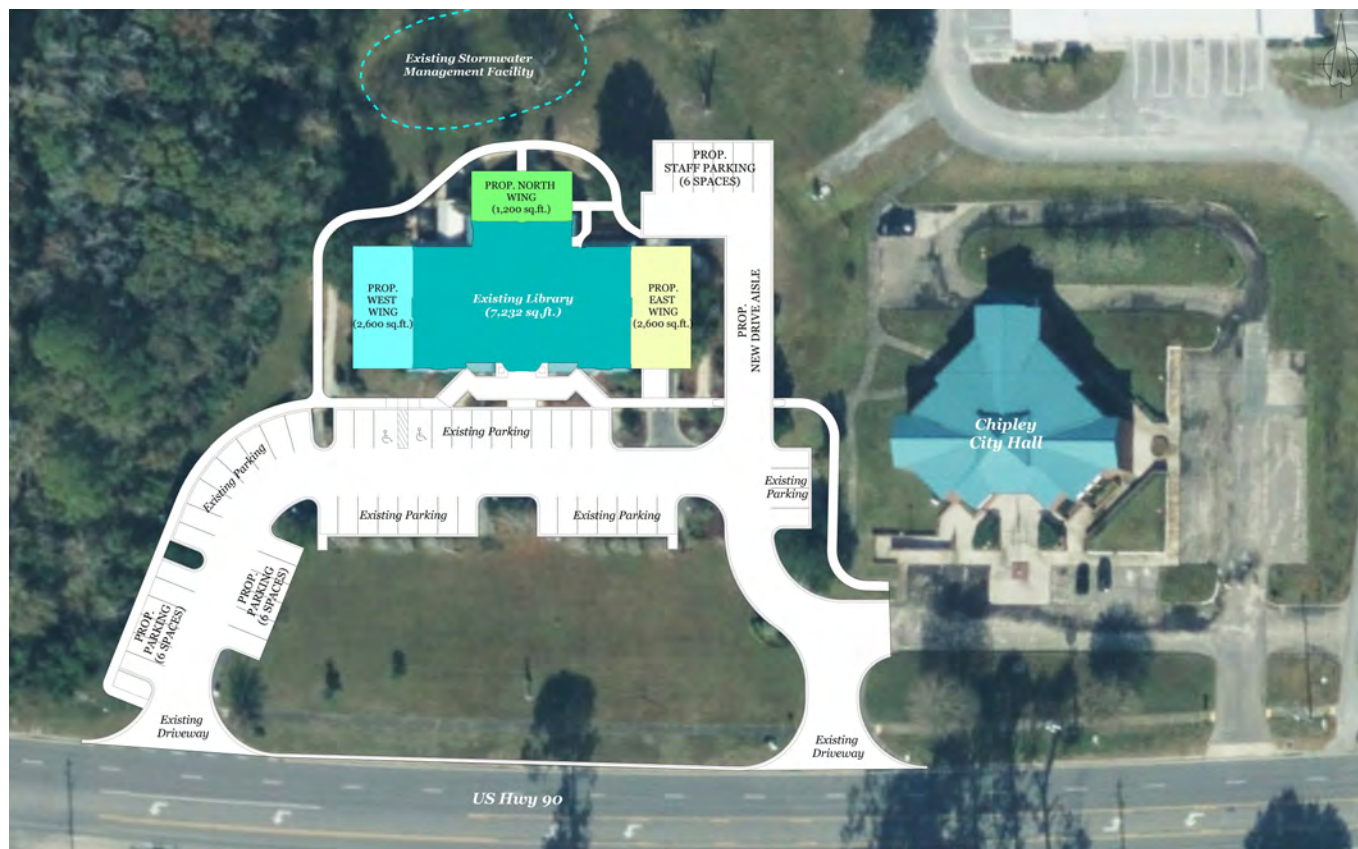
THIS PAGE INTENTIONALLY LEFT BLANK

ATTACHMENT
GEOTECHNICAL REPORT
(SOUTHERN EARTH
SCIENCES, INC.)



SOUTHERN EARTH SCIENCES

Geotechnical | Environmental | Materials Testing



Washington County Library Expansion Project

1444 Jackson Ave

Chipley, Florida

Melvin Engineering

SESI Project No: P25-018

May 2, 2025

Melvin Engineering
4428 Lafayette St.
Marianna, Florida 32446
Attn: Mr. Brent Melvin, PE

May 2, 2025
File No: P25-018

Subject: Geotechnical Services for the Chipley Library Expansion Project in Chipley, Washington County, Florida.

Dear Mr. Melvin:

Southern Earth Sciences, Inc., has completed the geotechnical services for the proposed Chipley Library Expansion project in Chipley, Florida. Our services were performed in general accordance with Proposal No. XP24-12.5.24-2, dated December 5, 2024. This report presents the results of our field and laboratory testing and includes recommendations with regard to the design and construction of the foundations.

PROJECT BACKGROUND & FIELD INVESTIGATIVE PROCEDURES:

The expansion project will consist of three new wings, one on each of the north, east, and west sides of the existing building. We have previously performed geotechnical testing for the project for the initial construction in 2001. Based upon this report, we encountered very soft clays and organic soils. The existing building footprint, including portions of the east and west wing were excavated and replaced with suitable fill soils. Settlements were monitored with plates prior to vertical construction. The settlement monitoring experienced settlements ranging from approximately 1.2 to 5.4-inches. However, based upon the documentation of the testing and available information, the limits of the previous excavation are unknown.

Prior to our field testing, proposed boring locations were marked and Sunshine State One Call of Florida was contacted to locate underground utilities. On March 19 through 21, 2025, personnel with our firm traveled to the project site and completed the field testing for the above referenced project. For our geotechnical investigation, four (4) cone penetrometer soundings were performed to approximately 35 to 60 feet below the existing ground surface. The cone penetrometer is track mounted and rather than sampling and testing at five foot intervals, as normally done with standard penetration borings, the cone penetrometer is an electronic device that provides continuous evaluation of the soils bearing capacity through point and frictional resistances. The cone penetrometer is hydraulically pushed into the soil with point and frictional resistances obtained continuously on a computer printout. This testing

Melvin Engineering
Chipley Library Expansion Project
Page 2

equipment provides an accurate definition of the soil strength characteristics and the changes in stratification. The cone soundings were performed in general accordance with ASTM D5778.

To verify soil conditions encountered within the depth of our cone soundings, direct push borings were performed to depths ranging from approximately 18 to 20 feet below the existing ground surface. The direct push borings were performed with our Geoprobe 6622 and the DT22 soil sampling system. This is a closed-piston sampler, with an inner piston rod and outer drive casing, and is driven to the top of the sampling interval. The inner piston rod is removed and the sampler is driven to collect a soil sample. The soil samples are collected in a clear 5-foot PVC liner and are delivered back to our laboratory for soil classifications and laboratory testing. Another direct push boring was performed near the existing stormwater pond to the north to a depth of approximately 15 feet below existing ground surface. A double ring infiltrometer test was performed near this location. Additionally, twelve (12) hand auger borings were performed to depths of approximately 4 to 7.5 feet below the existing ground surface.

Test locations were established in the field by using a 100-foot tape and estimating right angles with reference to existing landmarks; therefore, our test locations should be considered approximate. See the attached Figure for our approximate test locations.

LABORATORY TESTING PROCEDURES:

Laboratory investigative work consisted of physical examination of samples obtained during the soil test boring operation. Soil samples were visually classified in the laboratory in accordance with the Unified Soil Classification System. Evaluation of these samples, in conjunction with penetration resistances, have been used to estimate soil characteristics.

Natural Moisture: Twenty-three (23) samples were selected for determination of their natural moisture content. In the laboratory, each sample was weighed, dried, and its moisture content was calculated in general accordance with ASTM D2216.

Percent Passing 200 Mesh Sieve: Nineteen (19) samples were selected to determine their percent of materials, by dry weight, finer than the U.S. Number 200 Mesh Sieve. This test was performed in general accordance with ASTM D1140.

Atterberg Limits: Two (2) samples were selected to determine its plasticity in accordance with ASTM D4318.

Organic Content: Two (2) samples were selected to determine the percentage of organic material present. This test was performed in accordance with ASTM D2974.

Melvin Engineering
Chipley Library Expansion Project
Page 3

The laboratory test results are shown on the boring logs at the depth of the tested sample. Abbreviations of laboratory data are shown below:

NM = Natural Moisture Content (%)
-200 = Percent Finer than the U.S. No. 200 Mesh Sieve
LL = Liquid Limit (%), PL = Plastic Limit (%), PI = Plasticity Index
ORG= Organic Content (%)

CONE PENETROMETER SOUNDINGS:

CPT Log graphically indicates the cone tip resistance, friction ratio, equivalent N-value and interpreted soil type at each sounding location. Soil classifications and data were interpreted from methods recommended by Robertson and Campanella and/or the Swedish Geotechnical Institute Information Publication No. 15E. Correlations between Cone Resistance values and Standard Penetration Testing "N" values were performed according to the methods developed by Robertson, Campanella and Wightman.

The soil types and stratigraphy shown on the CPT Log sheets are based upon material parameters measured and evaluated as the cone is advanced. The CPT Log sheets were developed for general information only.

SITE AND SOIL CONDITIONS:

The Washington County library is located on the north side of Hwy 90, west of Chipley City Hall. As noted above, the existing library was constructed around 2001 and consists of a metal frame structure with a brick veneer, supported on a shallow foundation. Surrounding the building is parking and access drives to the south and east sides of the building. Additionally, there is stormwater management to the north. Based upon the provided topographic survey, the existing ground elevation immediately surrounding the building is approximately +80 Ft. However, the property slopes downward away from Hwy 90, near +84 sloping downward near the parking lot to approximately +79 Ft. North of the building, the site slopes downward toward the stormwater management. There are sidewalks surrounding the building on all sides, with an asphalt loop drive on the east side. The remaining area is maintained green space, with some trees and landscaping surrounding the building.

Based upon the results of our cone soundings and borings, the soils encountered within their depths can be categorized into different strata. The top eight to twelve feet typically consist of slightly clayey to clayey sands. These sands typically range from loose to medium dense, however, it appears test locations C-1 and C-4, located at the east and west proposed wings are medium dense to dense. Beyond the medium dense sands we then encounter very

Melvin Engineering
Chipley Library Expansion Project
Page 4

loose to loose clayey sands to an average depth of 13 to 15 feet, this layer also includes some soft clays, varying between locations. Beyond this depth, we typically encountered soft to very soft plastic clays and organic clays. These typically extend throughout the remaining depths of our cone soundings, however, erratic medium dense sand layers are encountered. Ten hand auger borings were also performed surrounding the existing building in an effort to determine if these areas were excavated and backfilled with suitable fill soils, as detailed in the previous geotechnical report. The soils encountered within these hand augers ranged from slightly silty and slightly clayey to clayey sands throughout their extent.

Within the borings performed for new pavement areas (test locations P-1 and P-2), we encountered varying soil conditions between locations. Test location P-2 appears to be consistent with the results of hand augers HA-1 through HA-10, consisting of slightly silty and slightly clayey to clayey sands. However, at test location P-1, located at the southwest access drive, we encountered approximately 1.5 feet of presumed fill soils, underlain by thin layers of organic clay and plastic clays, within the top three feet, underlain by clayey sands. At test location SW-1, near the existing stormwater management, we encountered slightly clayey to clayey sands within the top five feet. Beyond this depth we encountered organic clays and plastic clays for the remaining extent.

On the dates of our field testing (March 19 through 21, 2025), the groundwater levels were encountered at depths ranging from approximately 3.3 to 4.9 feet below existing ground surface. Fluctuations in the water table depths will occur due to changes in gradient, seasonal precipitation/evapotranspiration differences, any neighboring drainage/wetland influences, and perched conditions. Therefore, it is highly recommended that the groundwater levels be verified prior to any excavations on the site.

STRUCTURAL INFORMATION:

As noted above, there will be three new wings constructed on the existing structure. These will be located on the north, east, and west sides. These additions range from approximately 1000 square feet for the north side and approximately 1900 to 2600 square feet for the east and west sides, respectively. The construction type will match the existing building consisting of a single story metal frame structure with a brick veneer. You have provided a preliminary foundation plan showing the wall and column footings. We understand column loads will be in the range of 15 kips and wall loads will be in the range of 1 kip per lineal foot. The column footings are shown at 5-ft square, therefore, the soil contact pressure will be in the range of 600 psf. You have indicated that the wall and column footings will be constructed monolithic with the slab on grade, and the bottom of the proposed footings will be two (2) feet below finished floor elevation. Finished floor elevation will match the existing structure at +81.7 Ft. Existing elevation surrounding the building is typically near +80 feet, therefore,

Melvin Engineering
Chipley Library Expansion Project
Page 5

approximately one foot of fill soils may be required. Footings will bear within the existing soils. Due to the poor soils encountered beyond 10 feet and potential undermining of the existing foundations, we recommend minimizing the foundation depths and also recommend including top and bottom reinforcement within the continuous and column footings since these will be poured in a monolithic fashion. Additionally, we recommend the foundation additions are dowelled into the existing foundation at the interface, to reduce differential settlements. Further details will be provided below. Extreme caution should be used when excavating near the adjacent foundations. If any of the information above is incorrect, we should be contacted to provide additional information.

There will be two small areas of additional parking. One located near the southwest access drive and another on the northeast side of the building, north of the loop drive. Finished pavement grades are unknown, however, will likely match existing pavement grades within these areas. We anticipate minor cutting and filling to achieved finished pavement grades. Additionally, we understand the existing stormwater management may be expanded due to the increased impermeable areas. The pond would likely extend to the east, however, expansion details are currently in development.

FOUNDATION RECOMMENDATIONS:

Our evaluation of foundation conditions has been based on structural information presented in this report and subsurface data obtained during our investigation. In evaluating soil borings, we have used correlations that were previously made between penetration resistances and foundation stabilities observed in soil conditions similar to those encountered at your site.

Based upon the results of our borings, it appears the earthwork performed for the initial construction of the building, continued throughout the footprint of the proposed east and west wings. Generally, it appears the earthwork was performed along the north side as well, however, this area was not compacted to the same extent as the east and west wings. Generally, the soft clays and organic soils were encountered beyond 12 to 13 feet and will likely not experience significant settlements from the additions, based upon the minimal amount of fill soils and light structural loading. However, we recommend additional compaction is performed along the north wing addition. Due to the proximity of the adjacent building, vibratory compaction should not be performed. Compaction should be performed using the static weight of the roller/equipment, only. Extreme caution should be used when excavating near the adjacent foundations. It may be necessary to install temporary bracing or underpinning the existing footings to stabilize the existing foundation prior to any excavations. Again, heavy dynamic compaction should not be performed near the adjacent building. Within five feet of the existing building, only hand operated equipment should be used to compact the existing soils.

Melvin Engineering
ChIPLEY Library Expansion Project
Page 6

Based upon the results of our field and laboratory testing, and with the compaction of the loose sands as noted above, it is our opinion the proposed additions may be supported on a conventionally designed shallow foundation system. Based upon the structural information indicated above as well as the soil improvements indicated above, we have calculated settlements of approximately one inch. We recommend column footings and continuous footings to have minimum widths of 36-inches and 18 inches, respectively. We also recommend a minimum embedment depth of 18 inches from the bottom of the footings to the outside finished grade. As noted above, we recommend including top and bottom reinforcement within the monolithic footings. Prior to foundation construction we anticipate the following site and soil preparations:

1. Clear and grub the surface soils within the building area and extending at least five (5) feet beyond the building perimeter to remove all topsoil, organics, and other deleterious materials. Based upon the results of our borings organics were encountered within the top 6 to 12-inches.
2. Once the site has been grubbed, prior to the addition of fill soils (if necessary), compact the existing soils until a density of 95% of the Modified Proctor (ASTM D-1557) maximum dry density is achieved to a depth of one (1) foot below existing grade for the east and west wings, and to a depth of two (2) feet below existing grade for the north wing. Moisture conditioning of the soils including the addition of water or dewatering may be required to achieve optimum moisture conditions for compaction. Again, we do not recommend using a vibratory roller due to the proximity to the existing building. Only hand operated equipment such as sled tamps and jumping jacks should be used.

Note: Extreme care should be used when excavating near the existing footings, to not undermine the existing foundations. Sands that slough from beneath the existing structure will have detrimental effects to the foundations. As noted above bracing or underpinning may be necessary to prevent detrimental effects.

3. If necessary, Fill soils used to raise the building area to finished grade shall be sands to clayey sands (non-plastic) containing no more than 15%, by dry weight, finer than the U.S. No. 200 mesh sieve. Fill should be placed in thin level lifts not to exceed twelve (12) inches, loose, and compacted to a density of 95% of the Modified Proctor maximum dry density throughout its full depth. Again, we do not recommend using vibratory equipment for compaction due to the proximity of the adjacent structure.
4. When footings are excavated, compact the soils at the bottom of footings until a density of 95% of the Modified Proctor maximum dry density is achieved to a depth of one (1) foot below the bottom of footings. Within footing trenches near the existing building,

Melvin Engineering
Chipley Library Expansion Project
Page 7

we recommend hand compaction only, i.e., sled tamps or jumping jacks.

5. Laboratory moisture-density relationships (Proctors) and in-place density tests should be performed to verify compliance with the foregoing compaction recommendations. We recommend one density test per 50 lineal feet of wall footing, one density test per column footing, and one density test per 1000 square feet of existing soils and for each foot of fill soils.

FIELD TESTING FOR STORMWATER MANAGEMENT DESIGN:

While the borings and double ring infiltrometer tests performed for this project are representative of subsurface soil conditions at their respective locations/depths and for their respective vertical reaches, local variations of the subsurface materials, vertical infiltration rates, and seasonal high groundwater levels are anticipated. Soil descriptions and vertical infiltration rates, and seasonal high groundwater levels represent subsurface conditions at the designated locations.

The proposed development may include expanding the existing stormwater management facility. We understand the expansion may extend to the east, if necessary. The pond expansion would likely match the existing pond bottom. Based upon the provided survey, the pond bottom elevation appears to be in the range of +74 Ft, and appears to be approximately two feet below surrounding grade.

Groundwater level was encountered at the depth shown on the logs, which was approximately 4.2 feet below existing ground surface at test location SW-1, on the date of our testing. At test location SW-1, seasonal high groundwater level was determined by characteristics such as soil colors, soil mottles, root zone depths, and redoximorphic features. Based upon the results of our borings, the estimated depth to seasonal high groundwater level is approximately 3.0 feet (± 0.5 feet) below existing ground surface. However, the organic clays and plastic clays encountered beyond five (5) feet should be considered semi-confining. Please refer to the boring log attached. It may be advisable to have a Professional Surveyor obtain the elevations of our test locations which would help further define the elevation of the seasonal high groundwater elevation. Fluctuations in the water table depths will occur due to changes in gradient, seasonal precipitation/evapotranspiration differences, any wetland/neighboring drainage influences, and perched conditions. Therefore, it is highly recommended that the groundwater levels be verified prior to any excavations on the site.

Vertical Infiltration Rates:

To estimate the vertical infiltration rate at the proposed expansion, a double-ring

Melvin Engineering
Chipley Library Expansion Project
Page 8

infiltrometer test was performed at test location SW-1. This test was performed at a depth of approximately 1.5 feet below existing ground surface. The double-ring infiltrometer test was performed in general accordance with ASTM D-3385 "Infiltration Rate of Soils in Field Using Double-Ring Infiltrometers". The soils were pre-saturated prior to performing the test. The double ring infiltration test does not include the effect of long-term saturation and groundwater mounding.

The results for the double-ring infiltrometer test are graphically illustrated as accumulated intake (inches) versus time (min) and infiltration rate (in/hr) versus time (min) for the test period on the attached Graph 1. Based upon the results of our double-ring infiltrometer test, the unsaturated vertical infiltration rate at test location SW-1 is approximately 2.5 inches per hour. We should note these infiltration rates are not factored and should be used with an appropriate factor of safety.

The vertical infiltration rate stated above should not be considered the drawdown rate of the pond or swales. The drawdown rate is a complex 3-dimensional phenomenon dependent upon numerous factors including pond/system geometry, vertical and horizontal infiltration rates, groundwater mounding, etc. The prediction of the drawdown rate is made more difficult by varying soil/groundwater conditions. The Northwest Florida Water Management District recommends a correlation factor between unsaturated vertical infiltration rates and horizontal hydraulic conductivity of 1.5.

PAVEMENT ADDITION RECOMMENDATIONS:

Based upon the existing conditions, we anticipate minor cutting and filling will be required to achieve final pavement grades, as these will likely match existing pavement grades. Pavement recommendations are based upon a 15-year life. It should be noted that pavement maintenance and rehabilitation, including an overlay, might be required within the life of the pavement. We have assumed light automobiles as the primary traffic for this pavement. If any of these assumptions are incorrect, we should be notified to provide revisions to our pavement recommendations.

As noted above, thin layers of organic clay and plastic clays were encountered within the top three (3) feet at test location P-1, located near the southwest access drive. We recommend these soils are removed prior to placement of the base course. During the performance of our field testing, the groundwater level was encountered below these soils. However, dependent upon rainfall conditions at the time of construction, localized dewatering may be required. Once the unsuitable soils have been removed, they should be replaced with suitable fill soils described below. The fill soils should be placed in thin, level lifts of 12-inches or less, compacted each lift.

Melvin Engineering
Chipley Library Expansion Project
Page 9

Fill soils, shall be sands to clayey sands (non-plastic) containing no more than 15%, by dry weight, finer than the U.S. No. 200 mesh sieve and shall be free of organics, organic laden sands, rubble, clay balls, and other deleterious materials. Fill soils shall be placed in thin level lifts and compacted to a density of 95% of the Modified Proctor (AASHTO T-180) maximum dry density throughout its full depth.

Subgrade Preparation: Clear and grub the surface soils within the pavement perimeter, extending at least three (3) feet beyond the curblin, to remove all topsoil, organic laden sands, and other deleterious materials. Based upon the results of our borings, these materials were encountered within the top 6 to 12 inches. However, as noted above, organic clays were encountered at test location P-1 down to approximately 3 feet, which should be removed.

Prior to the addition of fill soils or once the soils have been excavated to the bottom of the base, compact the existing soils until a density of 95% of the Modified Proctor (AASHTO T-180) maximum dry density to a depth of twelve (12) inches. Fill soils described above should be placed to achieve final pavement grades. If there are no adjacent structures within 50 feet, a vibratory roller may be used. However, we do not recommend using vibratory compaction within one to two feet of the groundwater level. We also recommend that the top twelve (12) inches of subgrade soils be stabilized to achieve a Limerock Bearing Ratio of 40. We anticipate the existing soils may likely achieve this value, however, should be verified prior to construction.

Base: We recommend a limerock or graded aggregate base with a minimum thickness of six (6) inches in light traffic areas. Crushed concrete may be used if it meets the FDOT specifications requirements for a graded aggregate base. The base course should be obtained from an approved source. The base course should be placed and compacted in accordance with FDOT standard specifications.

Wearing Surface: We recommend a SP-12.5 asphaltic concrete wearing surface having a minimum thickness of two (2) inches in light traffic areas. The asphalt should be placed and compacted in accordance with FDOT standard specifications.

All materials and methods of placement shall be in accordance with applicable sections of the Florida Department of Transportation's "Standard Specifications for Road and Bridge Construction", (Latest Edition).

Additional Comments:

This investigation only deals with the near surface soil and rock deposits. It is not

Melvin Engineering
Chipley Library Expansion Project
Page 10

intended to include analysis/evaluation of deeper rock strata where cavities and caverns may exist. This report does not address the possibility of sinkhole occurrence at the site.

CONSTRUCTION TESTING SERVICES:

The effectiveness of the foundation will depend significantly on the proper preparation of the soils, as indicated previously. Therefore, we recommend Southern Earth Sciences, Inc., be employed as the testing laboratory to perform construction testing services. If we are not employed to provide construction testing services, Southern Earth Sciences, Inc., cannot accept any responsibility for any conditions which deviate from those described in this geotechnical report. Southern Earth Sciences, Inc., should be invited to the pre-construction meeting to discuss the project with all parties so that the project may be completed expeditiously and to the intent of our geotechnical report. We would be pleased to review the plans and specs as they relate to the soil preparation and provide a proposal for construction testing.

Melvin Engineering
Chipley Library Expansion Project
Page 11

GENERAL COMMENTS:

Professional judgments on design criteria are presented in this letter. These are based partly on our evaluations of technical information provided, partly on our understanding of the characteristics of the project being planned, and partly on our general experience with subsurface conditions in the area. We do not guarantee performance of the project in any respect, only that our judgments meet the standard of care of our profession.

This information is exclusively for the use and benefit of the addressee(s) identified on the first page of this report and is not for the use or benefit of, nor may it be relied upon by any other person or entity. The contents of this letter may not be quoted in whole or in part or distributed to any person or entity other than the addressee(s) hereof without, in each case, the advance written consent of the undersigned.

This report has been prepared in order to aid in the evaluation of this property and to assist the architects and engineers in the foundation, pavement, and stormwater management design. It is intended for use with regard to the specific project discussed herein, and any substantial changes in the buildings, loads, locations, or assumed (or reported) grades shall be brought to our attention immediately so that we may determine how such changes may effect our conclusions and recommendations. We would appreciate the opportunity to review the plans and specifications for the foundation and floor construction to verify that our conclusions and recommendations are interpreted correctly. Our report does not address environmental issues which may be associated with the subject property.

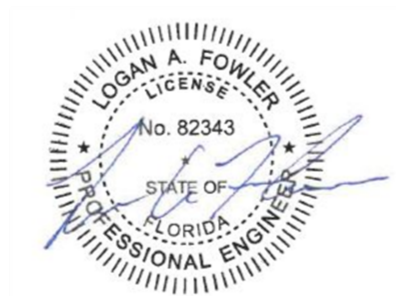
While the borings and cone penetrometer soundings performed for this project are representative of subsurface soil conditions at their respective locations and for their respective vertical reaches, local variations of the subsurface materials are anticipated and may be encountered. The boring logs and related information are based on the driller's logs and visual examination of selected samples in the laboratory. Delineation between soil types shown on the boring logs is approximate, and soil descriptions represent our interpretation of subsurface conditions at the designated boring location on the particular date drilled.

Melvin Engineering
Chipley Library Expansion Project
Page 12

We appreciate the opportunity to assist you. If you have any questions or if we may be of further assistance, please call at your convenience.

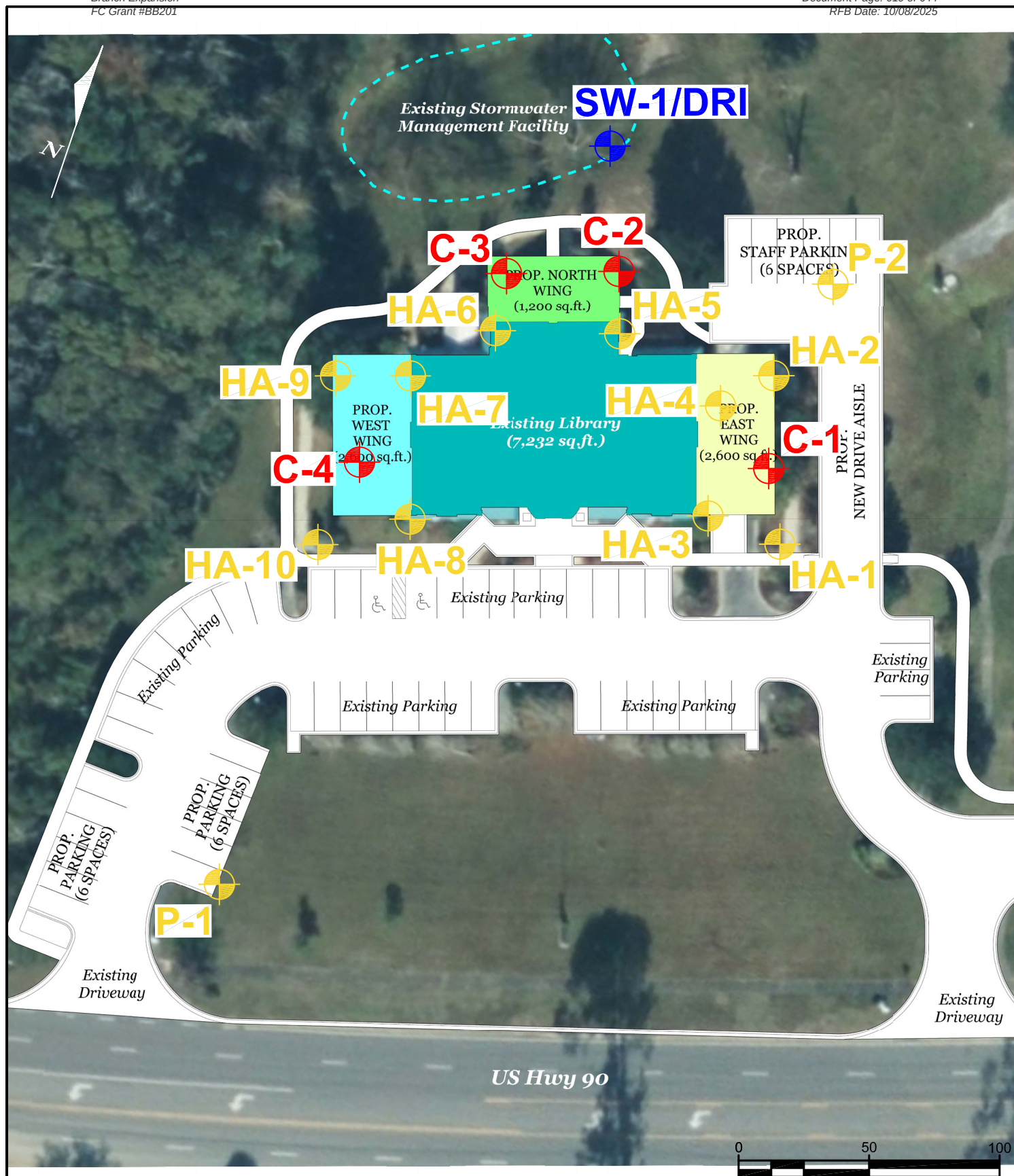
Sincerely,

SOUTHERN EARTH SCIENCES, INC.



Logan A. Fowler, P.E.
Eng. Reg. No. 82343
State of Florida

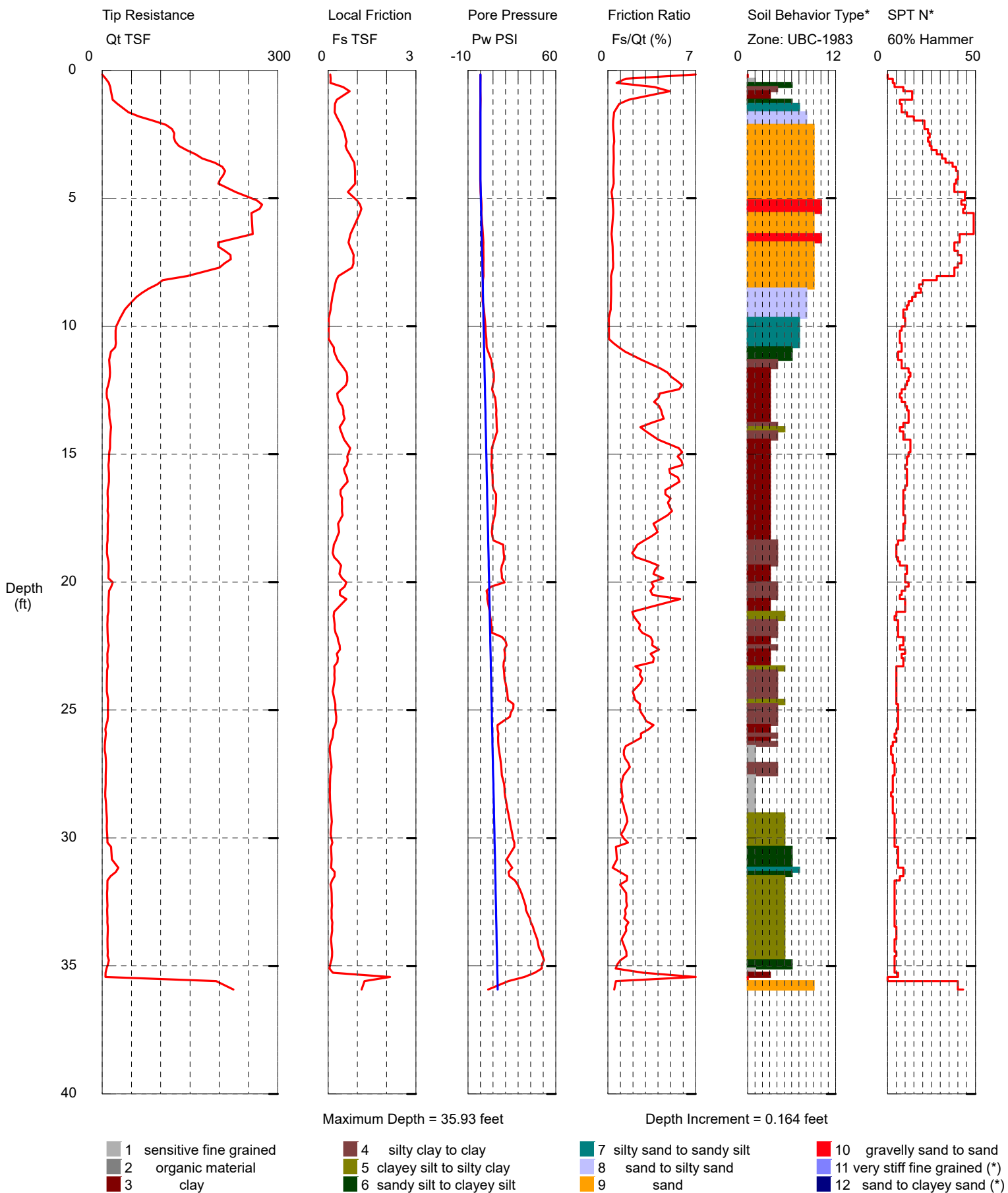
This item has been digitally signed and sealed by Logan A. Fowler, P.E. (FL Eng. License No.: 82343) using a Digital Signature. Printed copies of this document are not considered signed and sealed and the authentication code must be verified on any electronic copies.



SESI FILE NO: P25-018	 SOUTHERN EARTH SCIENCES	DRAWN BY:	HL	FIGURE I
Chipley Library Expansion Project Chiplev, FL		CHECKED BY:	LF	
		DATE:	4/29/25	APPROXIMATE TEST LOCATIONS
		SCALE:	1:50	

Operator: Pat Conroy
Sounding: C-1
Cone Used: DDG1702
Groundwater: 4.3 feet

CPT Date/Time: 3/19/2025 12:08:44 PM
Location: Chipley Library Expansion Project
Job Number: P25-018
Elevation: Unknown



Operator: Pat Conroy

Sounding: C-2

Cone Used: DDG1702

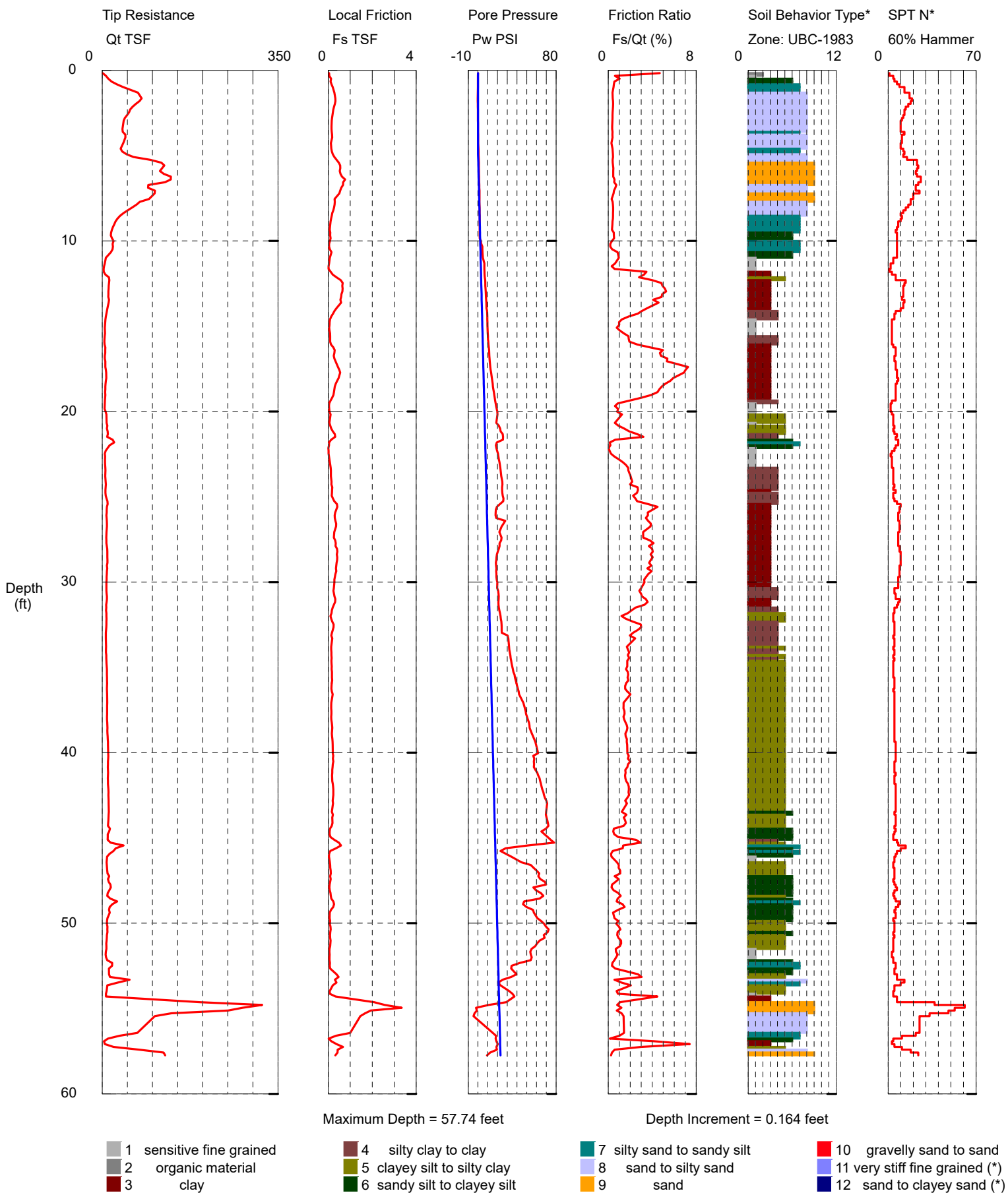
Groundwater: 4.8 feet

CPT Date/Time: 3/19/2025 11:26:54 AM

Location: Chipley Library Expansion Project

Job Number: P25-018

Elevation: Unknown



PROJECT: Chipley Library Expansion
LOCATION: Chipley, FL
PROJECT NO.: P25-018
DATE: 03/19/25

METHOD: Direct Push
DRILLER: PC
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

[illegible]

Water Level	Est. Seasonal High GWL:	Measured:	Perched:	Notes:

Water Observations: Groundwater Measured at 4.8 Feet Below Existing Ground Surface

N - SPT Data (Blows/Ft) P - Pocket Penetrometer (tsf)

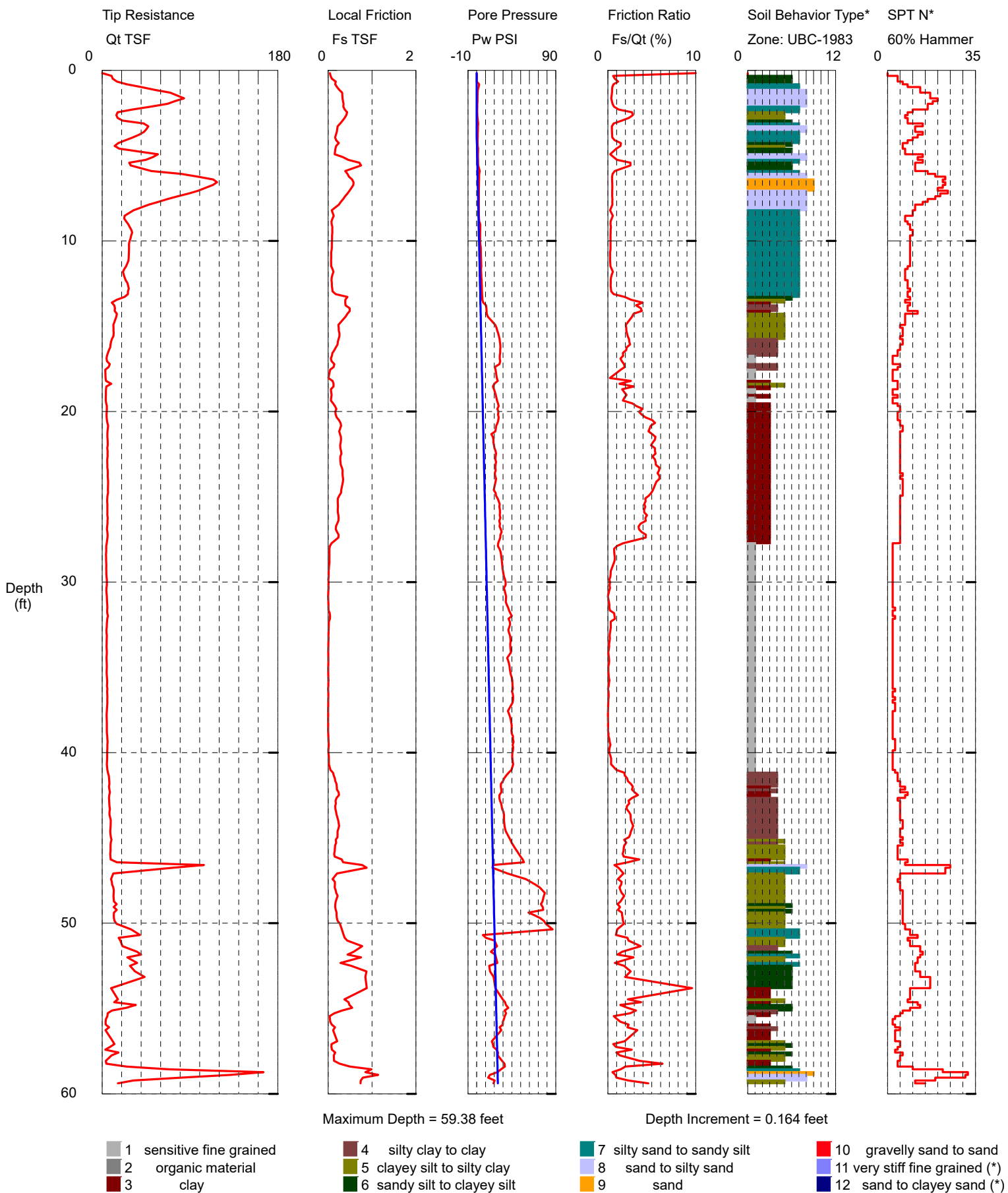
Sample Key:  SPT  Shelby Tube

SOUTHERN EARTH SCIENCES, inc.

LOG OF BORING P25-018.GPJ SES PC FL.GDT 4/17/25

Operator: Pat Conroy
Sounding: C-3
Cone Used: DDG1702
Groundwater: 4.0 feet

CPT Date/Time: 3/19/2025 10:17:15 AM
Location: Chipley Library Expansion Project
Job Number: P25-018
Elevation: Unknown



*Soil behavior type and SPT based on data from UBC-1983

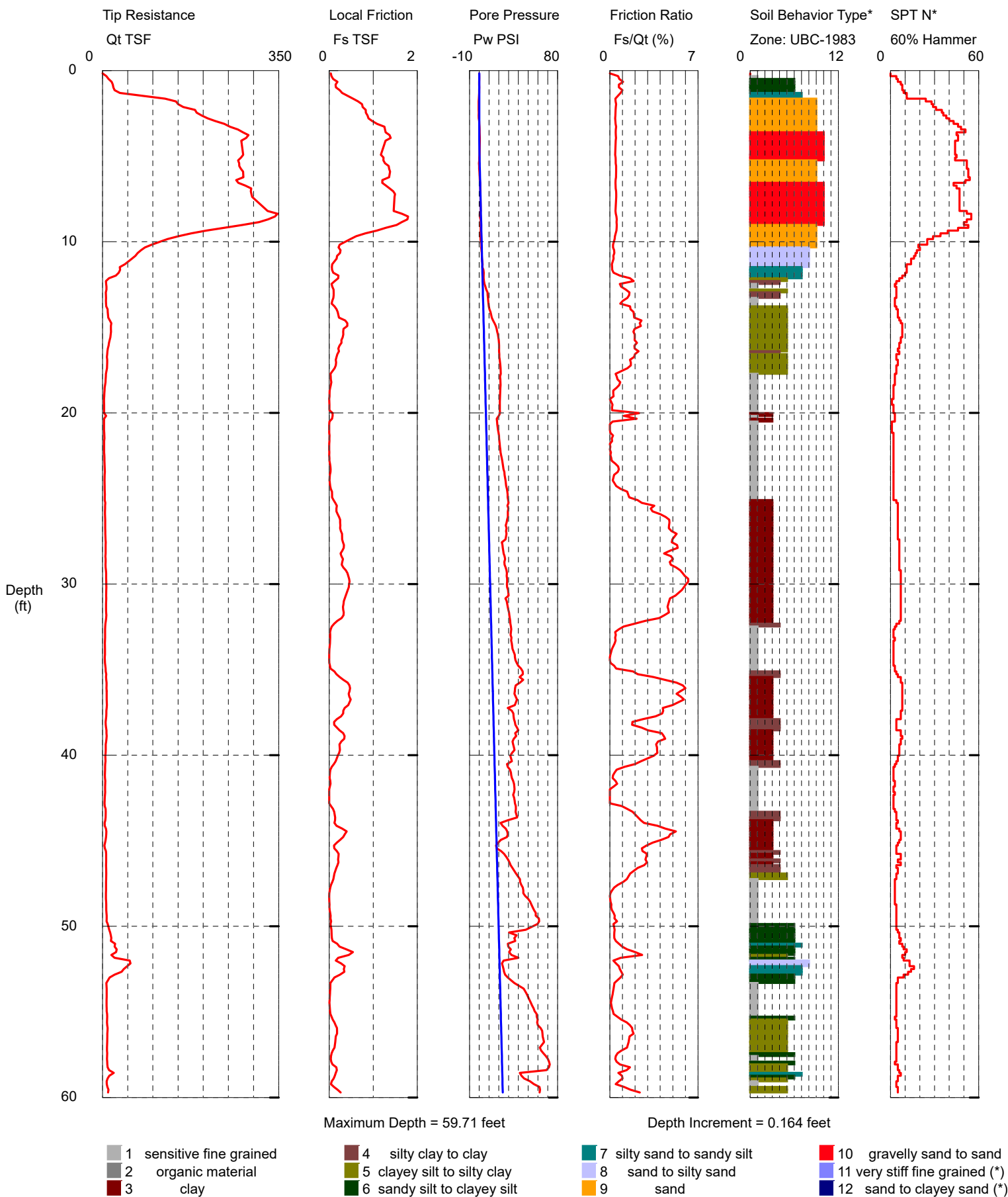
METHOD: Direct Push
DRILLER: PC
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

LOG OF BORING P25-018.GPJ SES PC FL.GDT 4/17/25

SOUTHERN EARTH SCIENCES, inc.

Operator: Pat Conroy
Sounding: C-4
Cone Used: DDG1702
Groundwater: 4.5 feet

CPT Date/Time: 3/19/2025 12:45:30 PM
Location: Chipley Library Expansion Project
Job Number: P25-018
Elevation: Unknown



*Soil behavior type and SPT based on data from UBC-1983

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

LOG OF BORING P25-018.GPJ SES PC FL.GDT 4/17/25

SOUTHERN EARTH SCIENCES, inc.

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

LOG OF BORING P25-018.GPJ SES PC FL.GDT 4/17/25

SOUTHERN EARTH SCIENCES, inc.

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

LOG OF BORING P25-018.GPJ SES PC FL.GDT 4/17/25

SOUTHERN EARTH SCIENCES, inc.

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

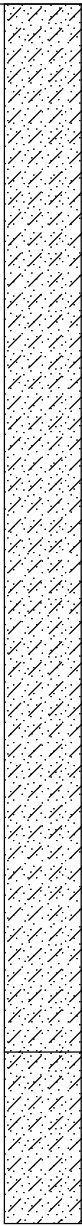
LOG OF BORING P25-018.GPJ SES PC FL.GDT 4/17/25

SOUTHERN EARTH SCIENCES, inc.

LOG OF BORING HA-5

PROJECT: Chipley Library Expansion
LOCATION: Chipley, FL
PROJECT NO.: P25-018
DATE: 03/20/25

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

Elevation / Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	LOCATION	▲ N Value (blows/ft) Atterberg Limits Natural Moisture PL MC LL 20 40 60 80	NATURAL MOISTURE (%)	ATTERBERG LIMITS (%)			PASSING #200 SIEVE (%)
			Per Plan			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			MATERIAL DESCRIPTION			LL	PL	PI	
0		SP-SC	Brown and Orange Slightly Clayey Medium to Fine SAND						
1									
2									
3									
4									
5									
6									
		SP-SC	Light Brown Slightly Clayey Medium to Fine SAND						

LOG OF BORING P25-018.GPJ SES PC FL.GDT 4/17/25

Water Level Est. Seasonal High GWL:  Measured:  Perched:  Notes:
Water Observations: Groundwater Measured at 4.9 Feet
Below Existing Ground Surface

N - SPT Data (Blows/Ft) P - Pocket Penetrometer (tsf)

Sample Key:  SPT  Shelby Tube

SOUTHERN EARTH SCIENCES, inc.

LOG OF BORING HA-6

PROJECT: Chipley Library Expansion
LOCATION: Chipley, FL
PROJECT NO.: P25-018
DATE: 03/20/25

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

Elevation / Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	LOCATION	▲ N Value (blows/ft) Atterberg Limits Natural Moisture PL MC LL 20 40 60 80	NATURAL MOISTURE (%)	ATTERBERG LIMITS (%)			PASSING #200 SIEVE (%)
			Per Plan			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			MATERIAL DESCRIPTION			LL	PL	PI	
0		SP-SC	Tan and Light Brown Slightly Clayey Medium to Fine SAND						
1									
2									
3		SP-SC	Brown and Orange Slightly Clayey Medium to Fine SAND						
4									
5									
6		SP-SC	Tan Slightly Clayey Medium to Fine SAND						
7									
8									

Water Level Est. Seasonal High GWL: Measured: Perched: Notes:
Water Observations: Groundwater Measured at 4.9 Feet
Below Existing Ground Surface

N - SPT Data (Blows/Ft) P - Pocket Penetrometer (tsf)

Sample Key: SPT Shelby Tube

SOUTHERN EARTH SCIENCES, inc.

LOG OF BORING HA-7

PROJECT: Chipley Library Expansion
LOCATION: Chipley, FL
PROJECT NO.: P25-018
DATE: 03/20/25

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

Elevation / Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	LOCATION	▲ N Value (blows/ft) Atterberg Limits Natural Moisture PL MC LL 20 40 60 80	NATURAL MOISTURE (%)	ATTERBERG LIMITS (%)			PASSING #200 SIEVE (%)
			Per Plan			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			MATERIAL DESCRIPTION			LL	PL	PI	
0									
1		SP-SM	Light Tan Slightly Silty Medium to Fine SAND						
2									
3		SP-SC	Tan and Orange Slightly Clayey Medium to Fine SAND						
4									
5									
6									

Water Level Est. Seasonal High GWL: Measured: Perched: Notes:
Water Observations: Groundwater Measured at 4.4 Feet
Below Existing Ground Surface

N - SPT Data (Blows/Ft) P - Pocket Penetrometer (tsf)

Sample Key: SPT Shelby Tube

SOUTHERN EARTH SCIENCES, inc.

PROJECT: Chipley Library Expansion
LOCATION: Chipley, FL
PROJECT NO.: P25-018
DATE: 03/20/25

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

[illegible]

Water Level	Est. Seasonal High GWL: 	Measured: 	Perched: 	Notes:
Water Observations: Groundwater Measured at 4.3 Feet Below Existing Ground Surface				

N - SPT Data (Blows/Ft) P - Pocket Penetrometer (tsf)

Sample Key:  SPT  Shelby Tube

SOUTHERN EARTH SCIENCES, inc.

LOG OF BORING P25-018.GPJ SES PC FL.GDT 4/17/25

LOG OF BORING HA-9

PROJECT: Chipley Library Expansion
LOCATION: Chipley, FL
PROJECT NO.: P25-018
DATE: 03/20/25

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

Elevation / Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	LOCATION	▲ N Value (blows/ft) Atterberg Limits Natural Moisture PL MC LL 20 40 60 80	NATURAL MOISTURE (%)	ATTERBERG LIMITS (%)			PASSING #200 SIEVE (%)
			Per Plan			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			MATERIAL DESCRIPTION			LL	PL	PI	
0		SP-SC	Brown and Orange Slightly Clayey Medium to Fine SAND						
1		SP-SC	Light Tan and Light Orange Slightly Clayey Medium to Fine SAND						
2		SP-SC	Light Brown and Orange Slightly Clayey Medium to Fine SAND						
3	 								
4									
5									
6									

Water Level Est. Seasonal High GWL: Measured: Perched: Notes:
Water Observations: Groundwater Measured at 3.3 Feet
Below Existing Ground Surface

N - SPT Data (Blows/Ft) P - Pocket Penetrometer (tsf)

Sample Key: SPT Shelby Tube

SOUTHERN EARTH SCIENCES, inc.

LOG OF BORING HA-10

PROJECT: Chipley Library Expansion
LOCATION: Chipley, FL
PROJECT NO.: P25-018
DATE: 03/20/25

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

Elevation / Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	LOCATION	▲ N Value (blows/ft) Atterberg Limits Natural Moisture PL MC LL 20 40 60 80	NATURAL MOISTURE (%)	ATTERBERG LIMITS (%)			PASSING #200 SIEVE (%)
			Per Plan			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			MATERIAL DESCRIPTION			LL	PL	PI	
0		SP-SM	Gray and Brown Slightly Silty Medium to Fine SAND						
1									
2									
3									
4		SP-SC	Brown and Orange Slightly Clayey Medium to Fine SAND						
5		SC	Gray Clayey Medium to Fine SAND						
6									
7									
8									

Water Level Est. Seasonal High GWL: ▾ Measured: ▾ Perched: ▾ Notes:
Water Observations: Groundwater Measured at 3.6 Feet
Below Existing Ground Surface

N - SPT Data (Blows/Ft) P - Pocket Penetrometer (tsf)

Sample Key: ▨ SPT ▩ Shelby Tube

SOUTHERN EARTH SCIENCES, inc.

LOG OF BORING P-1

PROJECT: Chipley Library Expansion
LOCATION: Chipley, FL
PROJECT NO.: P25-018
DATE: 03/20/25

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

Elevation / Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	LOCATION	▲ N Value (blows/ft) Atterberg Limits Natural Moisture PL MC LL 20 40 60 80	NATURAL MOISTURE (%)	ATTERBERG LIMITS (%)			PASSING #200 SIEVE (%)
			Per Plan			LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			MATERIAL DESCRIPTION			LL	PL	PI	
0		SP-SC	Tan Slightly Clayey Medium to Fine SAND						
1									
2		OH	Gray and Dark Gray Organic CLAY						
		SC	Brown and Orange Clayey Medium to Fine SAND						
		CL	Brown and Dark Gray CLAY						
3		SC	Gray and Dark Gray Clayey Fine SAND						
4	▼			●	15				26
5		SC	Light Gray, Tan, and Light Orange Clayey Fine SAND	●	23				40
6									
7									
8									

LOG OF BORING P25-018.GPJ SES PC FL.GDT 4/17/25

Water Level Est. Seasonal High GWL: ▼ Measured: ▼ Perched: ▼ **Notes:**
Water Observations: Groundwater Measured at 3.9 Feet
Below Existing Ground Surface

N - SPT Data (Blows/Ft) P - Pocket Penetrometer (tsf)

Sample Key: ▨ SPT ▩ Shelby Tube

SOUTHERN EARTH SCIENCES, inc.

LOG OF BORING P-2

PROJECT: Chipley Library Expansion
LOCATION: Chipley, FL
PROJECT NO.: P25-018
DATE: 03/20/25

METHOD: Hand Auger
DRILLER: PC/KK
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

Elevation / Depth	Soil Symbols Sampler Symbols and Field Test Data		USCS	LOCATION		▲ N Value (blows/ft)				NATURAL MOISTURE (%)	ATTERBERG LIMITS (%)				PASSING #200 SIEVE (%)
				Per Plan		20 40 60 80					LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI		
						Atterberg Limits Natural Moisture									
						MATERIAL DESCRIPTION		PL	MC					LL	
0			SP-SC	Brown and Gray Slightly Clayey Medium to Fine SAND											
			SP-SC	Light Brown Slightly Clayey Medium to Fine SAND											
1															
			SP-SM	Light Tan Slightly Silty Medium to Fine SAND											
2															
			SP-SC	Light Brown and Orange Slightly Clayey Medium to Fine SAND											
3															
4															
			SC	Brown and Gray Clayey Fine SAND											
										17				24	
5															
						</									

Water Level Est. Seasonal High GWL: Measured: Perched: Notes:
Water Observations: Groundwater Measured at 3.8 Feet
Below Existing Ground Surface

N - SPT Data (Blows/Ft) P - Pocket Penetrometer (tsf)

Sample Key: SPT Shelby Tube

SOUTHERN EARTH SCIENCES, inc.

LOG OF BORING SW-1

PROJECT: Chipley Library Expansion
LOCATION: Chipley, FL
PROJECT NO.: P25-018
DATE: 03/19/25

METHOD: Direct Push
DRILLER: PC
ENGR / GEOL: LF
SURFACE ELEVATION: Unknown

Elevation / Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	LOCATION		▲ N Value (blows/ft)					NATURAL MOISTURE (%)	ATTERBERG LIMITS (%)			PASSING #200 SIEVE (%)
			Per Plan		20 40 60 80									
					Atterberg Limits Natural Moisture									
					PL MC LL									
MATERIAL DESCRIPTION					20 40 60 80					LL	PL	PI		
0			SC	Brown and Gray Clayey Fine SAND with Trace Organics										
			SP-SC	Tan and Orange Slightly Clayey Medium to Fine SAND with Trace Rock										
			SC	Light Tan Slightly Clayey Medium to Fine SAND	●					9				11
	▽													
	▼		SC	Gray Clayey Fine SAND										
5														
			OH	Dark Gray Organic CLAY										
			CL	Gray CLAY										
			OH	Dark Gray Organic CLAY										
			CL	Gray and Dark Gray CLAY with Trace Organics		●				42				70
			CL	Gray and Light Gray CLAY										
						●				33				77
10														
			CL	Dark Gray CLAY										
			OH	Dark Brown and Gray Organic CLAY (ORG=10.1%)			●			47				
			CL	Light Gray CLAY										
15														

Water Level Est. Seasonal High GWL: ▽ Measured: ▼ Perched: ▼

Water Observations: Groundwater Measured at 4.2 Feet Below Existing Ground Surface

Notes:

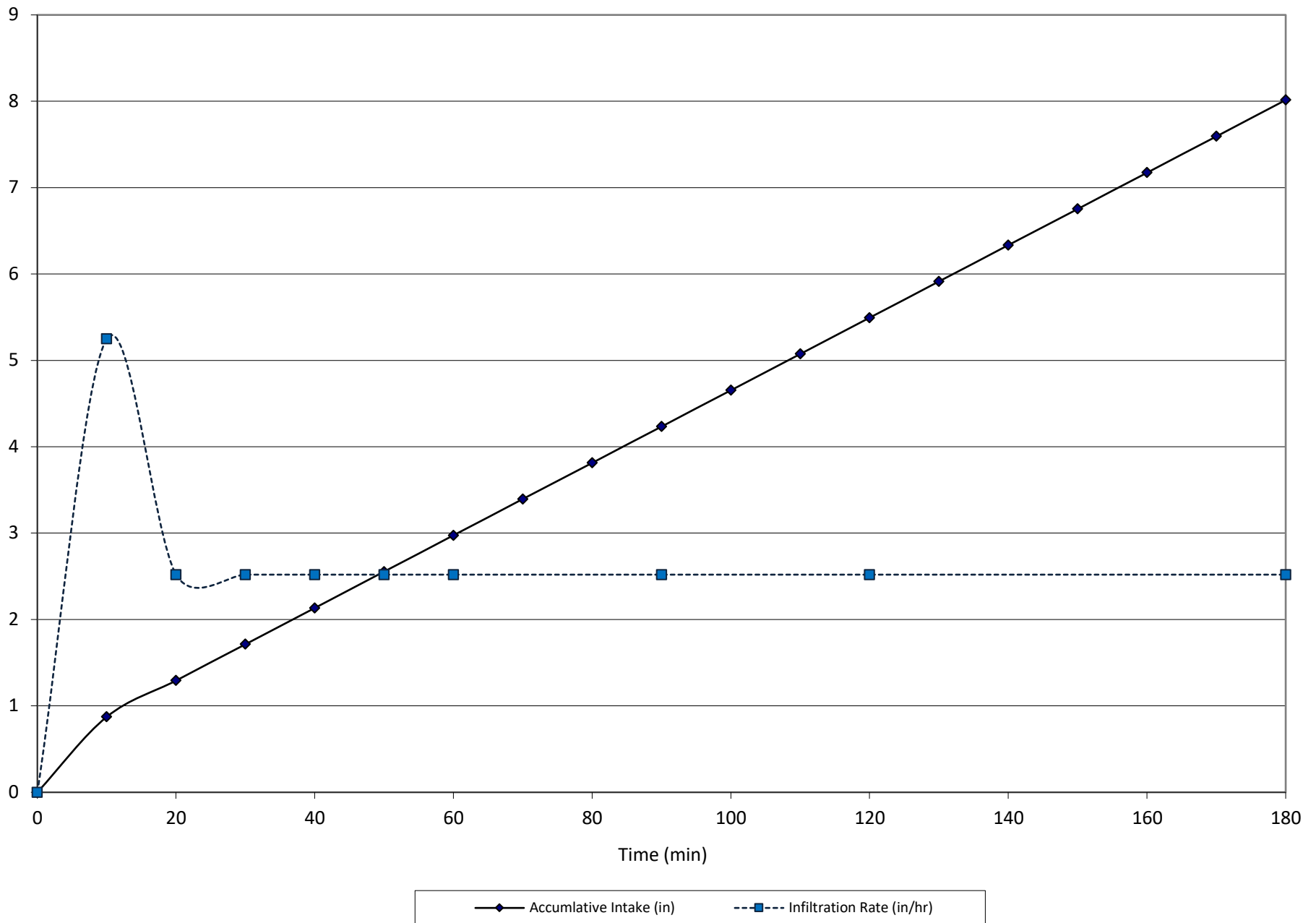
-Estimated Seasonal High Groundwater 3.0 Feet (+/-0.5 Feet) Below Existing Ground Surface

N - SPT Data (Blows/Ft) P - Pocket Penetrometer (tsf)

Sample Key: ▣ SPT ▣ Shelby Tube

SOUTHERN EARTH SCIENCES, inc.

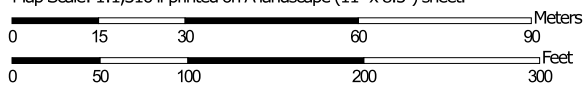
Graph 1
Double Ring Infiltrometer Test at SW-1



Soil Map—Washington County, Florida
(Chipley Library Expansion Project)



Map Scale: 1:1,310 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

4/17/2025
Page 1 of 3

Soil Map—Washington County, Florida
(Chipley Library Expansion Project)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, Florida

Survey Area Data: Version 21, Aug 23, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 10, 2024—Jan 20, 2024

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
12	Dothan loamy sand, 2 to 5 percent slopes	2.7	36.3%
52	Grady loam, ponded	2.9	39.2%
90	Rains and Bayboro soils, depressional	1.8	24.5%
Totals for Area of Interest		7.4	100.0%

Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time to perform additional study.* Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.



8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

Copyright 2004 by ASFE, Inc. Duplication, reproduction, or copying of this document, in whole or in part, by any means whatsoever, is strictly prohibited, except with ASFE's specific written permission. Excerpting, quoting, or otherwise extracting wording from this document is permitted only with the express written permission of ASFE, and only for purposes of scholarly research or book review. Only members of ASFE may use this document as a complement to or as an element of a geotechnical engineering report. Any other firm, individual, or other entity that so uses this document without being an ASFE member could be committing negligent or intentional (fraudulent) misrepresentation.